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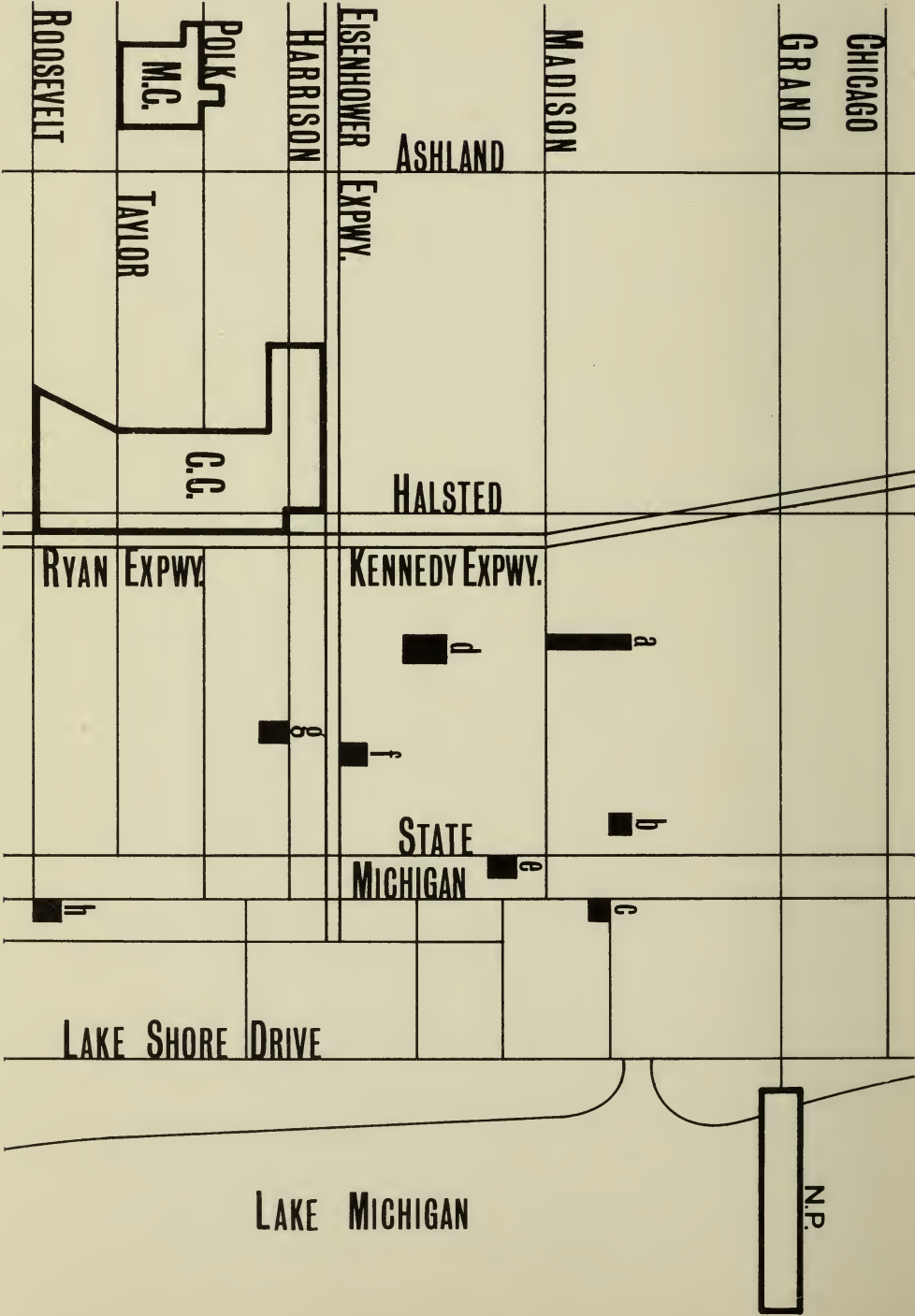


UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE

Legend

- a—North Western Station
- b—Bus Station
- c—Illinois Central (suburban)
- d—Union Station
- e—Airline Terminal
- f—LaSalle Street Station
- g—Grand Central Station
- h—Twelfth Street Station

Navy Pier—NP
Chicago Circle—CC
Medical Center—MC



**The University of Illinois
at
Chicago Circle**

THE UNIVERSITY OF ILLINOIS
DEC 1 1965
CHICAGO, ILL.

Contents

Academic Calendar	5
Board of Trustees	9
Administrative Officers	10
The Faculty	13
Perspective	30
Admission to the University	48
General University Requirements	67
The College of Architecture and Art	73
The College of Business Administration	79
The Division of Education	83
The College of Engineering	89
The College of Liberal Arts and Sciences	97
The Division of Physical Education	115
Courses of Instruction	119
Index	194

This publication is an announcement of
the 1965-1966 academic year.

Academic Calendar

1965-1966

Chicago Circle

Fall Quarter

September 20-24, M-F

September 27, M

September 27, M

November 25, 26, ThF

December 10, F

December 10, F

Registration and orientation

Quarter begins

Instruction begins

Thanksgiving (classes dismissed)

Instruction ends

Quarter ends

Winter Quarter

January 3, M

January 3, M

January 3, M

March 18, F

March 18, F

Quarter begins

Registration

Instruction begins

Instruction ends

Quarter ends

Spring Quarter

March 28, M

March 28, M

March 28, M

June 10, F

June 10, F

June 10, F

Quarter begins

Registration

Instruction begins

Instruction ends

Commencement

Quarter ends

Summer Quarter

June 20, M

June 20, M

June 20, M

July 4, M

September 2, F

September 2, F

Quarter begins

Registration

Instruction begins

Independence Day (classes dismissed)

Instruction ends

Quarter ends

Urbana

First Semester

September 13-20, M-M
September 15-18, W-S
September 20, 7 a.m., M
November 24, 1 p.m., W
November 29, 1 p.m., M
December 3, F

December 22, 1 p.m., W
January 3, 1 p.m., M
January 17-25, M-T

New Student Program
Registration
Instruction begins
Thanksgiving vacation begins
Thanksgiving vacation ends
Illinois Day (State admitted to the Union,
1818)
Christmas vacation begins
Christmas vacation ends
Semester examinations

Second Semester

January 31-February 7, M-M
February 2-5, W-S
February 7, 7 a.m., M
March 2, W
April 9, 12 noon, S
April 18, 1 p.m., M
April 29, F
May 30, M
May 31-June 8, T-W
June 18, S

New Student Program
Registration
Instruction begins
University Day (University opened, 1868)
Spring vacation begins
Spring vacation ends
Honors Day (Classes dismissed at noon)
Memorial Day (holiday)
Semester examinations
Commencement exercises

Eight-Week Summer Session

June 20, M
June 21, 7 a.m., Tu
July 4, M
August 12, 13, FS

Registration
Instruction begins
Independence Day (holiday)
Summer session examinations

1966-1967

Chicago Circle

Fall Quarter

September 19-23, M-F
September 26, M
September 26, M
November 24, 25, ThF
December 9, F
December 9, F

Registration and orientation
Quarter begins
Instruction begins
Thanksgiving (classes dismissed)
Instruction ends
Quarter ends

Winter Quarter

January 3, Tu
January 3, Tu
January 3, Tu
March 17, F
March 17, F

Quarter begins
Registration
Instruction begins
Instruction ends
Quarter ends

Spring Quarter

March 27, M
March 27, M
March 27, M
May 30, Tu
June 9, F
June 9, F

Quarter begins
Registration
Instruction begins
Memorial Day (holiday)
Instruction ends
Quarter ends

Summer Quarter

June 19, M
June 19, M
June 19, M
July 4, Tu
September 1, F
September 1, F

Quarter begins
Registration
Instruction begins
Independence Day (holiday)
Instruction ends
Quarter ends

Urbana

First Semester

September 12-19, M-M
September 15-17, Th-S
September 19, 7 a.m., M
November 23, 1 p.m., W
November 28, 1 p.m., M
December 3, S

December 22, 1 p.m., Th
January 3, 1 p.m., Tu
January 16-24, M-Tu

Second Semester

January 30-February 6, M-M
February 2-4, Th-S
February 6, 7 a.m., M
March 2, Th
March 25, 12 noon S
April 3, 1 p.m., M
May 5, F
May 30, Tu
May 31-June 8, W-Th
June 17, S

Eight-Week Summer Session

June 19-20, M-W
June 20, 7 a.m., Tu
August 11-12, F-S

New Student Program
Registration
Instruction begins
Thanksgiving vacation begins
Thanksgiving vacation ends
Illinois Day (State admitted to the Union,
1818)
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Christmas vacation ends
Semester examinations

New Student Program
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Spring vacation begins
Spring vacation ends
Honors Day (classes dismissed at noon)
Memorial Day (holiday)
Semester examinations
Commencement exercises

Registration
Instruction begins
Summer session examinations

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Perspective

The University of Illinois at Chicago Circle was activated on February 22, 1965, not as a new institution but as the successor to the Chicago Undergraduate Division, which, during 19 years of service to the college-commuting students of the Chicago area, provided the first two years of college and preprofessional work for over 100,000 students.

In the spring of 1946 the University of Illinois knew that men and women from the Armed Services would inundate the Urbana-Champaign campus. It was impossible to construct additional facilities in time to meet the demand, and restricting enrollment was undesirable. Therefore, Navy Pier, already used as a school and adaptable to the needs of a freshman-sophomore program, was leased by the Board of Trustees, and the Chicago Undergraduate Division was organized. That fall, 3800 students, three-fourths of them veterans, were enrolled and attended classes of reasonable size taught by competent faculty in quarters at least minimally satisfactory. Without the Chicago Undergraduate Division there would have been no place for most of them to go.

Although the percentage of veterans dropped slightly in 1947, enrollment rose above 4500, for as the wave of veterans moved through the freshman and sophomore years, their places were taken by their nonveteran brothers and sisters.

As the years passed, it became evident that the need for an undergraduate division in Chicago was permanent. In January, 1961, the Board of Trustees approved the granting of baccalaureate degrees by the Chicago Undergraduate

Division as soon as an adequate campus was available: the Chicago Circle site, where the Eisenhower, Ryan, and Kennedy Expressways converge, was selected in 1961.

The first class will be graduated in June, 1967, although some students will be awarded degrees in June, 1966, in the Colleges of Business Administration and Liberal Arts and Sciences. Work for the baccalaureate degree is offered in the Colleges of Architecture and Art, Business Administration, Engineering, and Liberal Arts and Sciences (the curricula of which include secondary school programs in teacher education) and in the Divisions of Education (teaching in the elementary school) and Physical Education.

In the first phase at Chicago Circle, students continuing from the Chicago Undergraduate Division in Architecture and Art, Engineering, Education, and Physical Education will be unable to complete degree requirements without loss of time and should plan to graduate from Urbana or elsewhere. Since the curricula of these colleges mesh with the corresponding Urbana curricula, transfers to that campus will not be under a handicap.

The June, 1967, degrees will be awarded to those candidates in the College of Business Administration and the College of Liberal Arts and Sciences who have met all general-University requirements and all college requirements, have earned their last 45 quarter hours of credit at Chicago Circle without interruption, and have satisfied the degree requirements for the corresponding college and department at Urbana-Champaign.

The Chicago Circle Campus is Located just south and west of the Loop in an area bounded by Harrison, Halsted, Morgan, and Taylor Streets. The mail address is Box 4348, Chicago 60680. Transportation to the campus is by way of the CTA, which has built a station at Peoria Street especially to service Chicago Circle, and by the Halsted, Harrison, and Taylor Street buses.

The Courses taught on the Urbana and Chicago Circle campuses are identical in content, although some courses taught on one are not offered on the other. It should be born in mind that Urbana is on the semester system, Chicago Circle on the quarter system. Degrees are granted at Chicago Circle although not in all colleges or curricula initially. The first senior class will be graduated in 1967 in the Colleges of Business Administration and Liberal Arts and Sciences. For the 1965-1966 academic year the University of Illinois at Chicago Circle offers degree programs in these colleges and divisions.

Architecture	Four of five years
Art	Three of four years
Business Administration	Four years
Elementary Education	First year
(Subject to approval by the State Board of Higher Education)	

Engineering
Liberal Arts and Sciences
Physical Education

First of four years
Four years
Two of four years

The succeeding years will be added sequentially.

Tuition and Fees vary for residents and nonresidents:

Residents of Illinois: \$97 per quarter

Nonresidents of Illinois: \$290 per quarter

See page 63ff. for a list and a description of all fees. When a student registers at Chicago Circle for the first time, he pays a \$5 general deposit. Payment of tuition and fees is made in full when the student registers. However, there is a deferred-fee plan; for information about it, consult the Business Office.

Registration is the act of enrolling in an approved program of courses after the student has been granted a permit to enter and has completed:

1. Course placement examinations.
2. A medical examination.
3. Program advisement and approval (a program is the set of courses and sections in which a student is registered at a given time).
4. Registration is not complete until all fees have been paid or arrangements have been made with the Business Office for the student to use the deferred-fee plan.

Financial Aid is available in the form of scholarships (page 35), loans, (page 36), and part-time employment (page 37). In addition, each student who attends the University is the recipient of a type of scholarship represented by the educational subsidy provided by the General Assembly from tax funds. This large contribution toward the costs of instruction and facilities makes possible the greatly reduced charges for tuition and fees.

Music Curricula are not offered on the Chicago Circle campus. However, the College of Liberal Arts and Sciences offers courses in music.

Physical Education is required unless you are a veteran or the University Health Service recommends a waiver on physical grounds or you enter with junior standing. Otherwise, you must complete 6 quarters of physical education. See page 115. Registration in R.O.T.C. does not exempt students from the requirements in physical education.

R.O.T.C. is not required but participation is urged. See page 43.

The Student Activities Program is carried out by more than 60 different student organizations. Extracurricular activities are recognized as an important part of campus life and are encouraged as a part of the broad education of the student. These groups sponsor varied activities for the benefit of their memberships and plan programs for the entire student body.

The Student Counseling Service offers vocational, personal, and educational counseling. Counseling and clinical psychologists help students make more effective use of their intellectual and personality resources. See page 34.

The Athletic Program consists of eleven varsity sports—football, basketball, baseball, cross-country, track, wrestling, swimming, soccer, gymnastics, tennis, and golf. A special ruling permits freshmen in good standing to participate in varsity sports. The University of Illinois at Chicago Circle is a charter member of the Gateway Athletic Conference.

An extensive intramural-sports program serves over 2,000 students each semester. The Women's Athletic Association and Orchesis offer sports activities and dance activities.

Foreign Students from many countries are now attending classes on this campus. See page 38.

Housing is not available since most of the students live at home. However, students with questions about housing and those students transferring to Urbana from Chicago Circle may obtain housing information from the Student Affairs Offices on the eighth floor of University Hall.

Night Classes are not held.

Extramural Courses are offered by the Division of University Extension. The facilities at Chicago Circle are used at night for extramural courses offered under the auspices of the Division of University Extension. Call the Illini Center, 663-7193, for further information.

Correspondence Courses are offered by the Division of University Extension. For information write to the Division of University Extension, University of Illinois, Urbana, Illinois.

Visitors are not permitted in classes unless they register for formal visitor (sometimes called auditor) status and pay the appropriate fees. Permission is sought from the dean of the college offering the course and is granted if the department head recommends it and the instructor consents. See page 65 for fees.

Other University of Illinois Facilities In Chicago are at the Medical Center, which houses the College of Medicine (including the School of Associated Medical Sciences) Dentistry, Nursing, and Pharmacy and the Health Sciences Division of the Graduate College.

Information may be obtained from the University of Illinois at the Medical Center, 1853 W. Polk Street, Chicago, Illinois 60612, or by calling 663-7000.

Transfer to Urbana should be made at the end of the student's year, since Chicago Circle operates on the quarter system and Urbana on the semester system. See page 69.

Cars are used by the students as personal requirements permit. The University parking lots, self-liquidating and self-sustaining projects, are adjacent to the campus.

Fees and procedures for parking will be announced before the beginning of the fall quarter 1965.

The Academic Life of the Student is supervised by the dean of the college in which the student enrolls; however, the University's interest in the individual student extends beyond the classroom to include his personal welfare and his orientation to college life.

A member of the Vice President's staff has responsibility for integrating academic and educational experiences of students with the supporting student services and out-of-class organizations and activities. Such functions and offices as those of the Health Service, Student Counseling Service, Office of Financial Aids, Office of Organizations and Activities, Dean of Men, Dean of Women, and Coordinator of Foreign Student Affairs, together with their staffs, come under his purview. Staff of these offices are advisers to whom students may turn for assistance with health problems and personal problems, for academic counseling, for assistance in securing part-time employment and other financial aid, for assistance with extra-curricular activities, including clubs and organizations, planning and organizing special events and all-University social functions, interpretation of University policies, and many other matters. Besides being available for daily counseling, these staff members also advise certain student groups. The offices of all student affairs staff are open to any student for individual conference and to parents for such inquiries as they may wish to make.

Academic and Other Regulations. The student should familiarize himself very early with the University and with the customs and policies of this campus. Each incoming student receives a copy of the latest edition of *Guidelines and Code*, which provides information about the University. The student has a personal obligation to be familiar with its contents. *Academic Regulations*, which is also received by each incoming student, provides further information on general University procedures and on the student's relationships with his college.

Student Services

The Student Counseling Service provides the student the benefits of psychological testing and counseling, and it is his privilege to make use of the following services whenever the need arises.

Pre-entry Counseling and Testing is offered to all graduating high school seniors who have completed the American College Test, which is required of students making application for admission to the University (see page 59). This program helps the student to determine which college or curriculum of the University best meets his needs, to formulate his educational and vocational goals, and to clarify his thinking on how to make a good start in his college work.

The Freshman Guidance Examinations measure reading comprehension, reading speed, and vocabulary and attempt to identify areas of academic interest. In addition, the results of his American College Test will be available for interpretation to the student.

Educational, Vocational, and Personal Counseling are available to any student who is uncertain about his choice of college, curriculum, or major, needs help in choosing his occupation, or is having personal problems.

Financial Aid

Scholarships of various types, loans, and employment are the main areas of financial aid available to the student.

Scholarships at the University of Illinois are limited in number and are awarded to the best qualified applicants. Each scholarship may have specific restrictions; in addition, nearly all, except military scholarships, require:

1. A superior scholastic record.
2. Evidence of financial need.

Financial need is evaluated from the Parents' Confidential Statement of financial status, to be filed with the College Scholarship Service. Forms and information can be obtained from high school counselors or from the office of the Director of Financial Aid at Chicago Circle.

Most scholarships are awarded in late spring or early summer for the following school year. Applications for fall quarter awards should be made as soon as possible after the preceding November 1. Applications are accepted after October 1 for the limited number of awards granted for succeeding quarters. A student currently enrolled in the University of Illinois may file an application at any time if his scholastic average is 3.75 or higher.

University Scholarships. Since the University of Illinois is a state-supported institution, most of its scholarships are restricted to Illinois residents. However, the University does have some funds for scholarships for out-of-state students.

Some grants are made in cash; others exempt the recipient from the payment of tuition and, in certain cases, fees. Most annual scholarships are renewed if the student maintains the required scholastic average.

An entering freshman who is awarded one of these scholarships must rank in the top quarter of his high school class and must demonstrate financial need.

Military Scholarships. Any person who served in the Armed Forces of the United States of America during World War I or any person who served in those Armed Forces at any time after September 16, 1940, and who completed at least six months of active duty followed by an honorable dis-

charge may qualify for a tuition scholarship if he was a resident of the State of Illinois or was a student in the University of Illinois at the time he entered the service. Any veteran who meets University admission requirements is scholastically qualified for this scholarship. The Illinois Military Scholarship may not be used during any period when the veteran is receiving financial aid for his education from the United States government.

Work Scholarships for Superior Students. Each year the Financial Aids Committee, under authority from the Board of Trustees, selects worthy entering freshmen for the Work Scholarship Program. A Work Scholarship exempts the student from the tuition charge each quarter and requires an average of ten to twelve hours of work per week, which makes it possible for him to earn money for most of his other college expenses. Information about scholarships may be obtained from the offices of the Director of Financial Aids, the Dean of Men, or the Dean of Women.

Loan Funds. Because the number of scholarships is so limited and because many worthy students are unable to qualify for those available, other forms of financial aid are provided at the University of Illinois to assist the student in financing his college education.

The National Defense Education Act of 1958 makes available substantial federal funds for loans to superior students. Applicants must be United States nationals. This includes citizens and all persons who are in the United States on a permanent-resident status. Borrowers are required to sign an oath of allegiance to the United States. In approving these loans, preference is given to applicants who express a desire to teach in elementary or secondary schools and to applicants whose academic background indicates a superior capacity for or a preference in science, mathematics, engineering, or a modern foreign language. All applicants must present superior academic records. Need for financial assistance must be shown. Students currently enrolled in the University of Illinois and progressing satisfactorily toward a degree may be eligible.

Loans are limited to \$1,000 each year (July 1 to June 30), with a maximum of \$5,000. The borrower must sign a promissory note. These federal loans carry 3 percent interest beginning one year after the borrower ceases to be a full-time student, either by graduation or by withdrawal. A postponement of payments on the note, of not more than three years, may be arranged during the time the borrower is serving in the Armed Forces of the United States. Interest is not charged during this period. Those who teach full time in public elementary or secondary schools may have as much as 50 percent of the debt cancelled at the rate of 10 percent for each year of teaching. In case of death or permanent disability of the borrower, the loan and interest thereon may be cancelled.

University Loans, both long term and short term, are made to the student who can demonstrate need. A number of privately endowed loan funds exist in addition to those covered by University and federal funds.

Long-term University Loans are usually available to students who have completed with a satisfactory record a year or more at the University. For any one student the maximum loan that may be outstanding at one time is \$2,500.

Arrangements may be made to repay loans over a four-year period; payments begin four months after the student leaves school or otherwise ceases to be enrolled on a full-time basis. Security, in the form of a qualified endorser as a cosigner, or evidence of collateral satisfactory to the Business Office is required for all long-term loans unless otherwise provided in the deed or gift of the fund or by waiver in meritorious cases, as determined by the Director of Financial Aids.

Short-Term University Loans may be requested by new students as well as by those already on campus. Loan amounts range to \$100 and must be repaid by the end of the *semester* in which the loan is granted.

Emergency Aid. A student in good standing and in immediate need because of an emergency may apply for aid in any amount up to \$15 by contacting the Dean of Men or the Dean of Women, who administer the Dean of Men or Dean of Women Emergency Aid and the Faculty Women's Club Emergency Fund.

Student Employment—Work-Study Programs permit considerably more than half of the students at Chicago Circle to earn a part of their college expenses.

Students who need to work part time will find a variety of opportunities available. The Student Employment Office makes a sincere effort to place all deserving students. Job opportunities, both on and off campus, are listed with and are handled by this office.

Freshmen are advised to approach a work situation cautiously, especially during their first quarter in school.

Job referrals are usually made only after the student has registered for academic courses, but a new student who has been admitted to the University and has a registration permit may also file an application for employment.

The University Health Service promotes better physical and mental health for the students at Chicago Circle. Health Service doctors are experienced clinicians, and most of them have practiced for years as family physicians or as specialists.

Medical examinations are required of all students before their first

registration. The examination may be made by the family physician at the student's expense, or in the case of foreign students and those students who request to have the examination without charge, by the University Health Service during the specified time before registration.

Beds for the temporary day care of ill students are provided. The University does not provide hospital care for its students. The large majority of students are from families living in the Chicago area: hence, cases requiring bed care can be referred to the student's family doctor and to hospitals of the community.

The University provides clinic services for both preventive medicine and treatment. The cost of those medical expenses that cannot be assumed by the Health Service is covered by the student hospital-medical-surgical insurance, supervised by the Insurance Division of the Business Office, at a cost to the student of \$6 per quarter.

The Director of Organizations and Activities is responsible for assisting over 60 different student organizations active at Chicago Circle. Out-of-class activities and organizations are encouraged as a part of the broad education of the student. In the next few years, existing organizations and activities will need to examine their purpose and function in the light of the needs of the campus. The number of organizations is expected to grow.

The Dean of Men and Dean of Women and their staffs are available daily for conferences with students or with their parents. The Dean of Men and Dean of Women work closely with various student activities and organizations. Their offices are on the eighth floor of University Hall.

The Coordinator of Foreign Student Affairs assists foreign students in evaluating their abilities, planning their programs, and interpreting regulations applicable to them. This service includes assistance on problems of extension of stay, employment, border crossing, and the details of maintaining legal status.

Honors Programs

Programs for superior students are offered in several categories at Chicago Circle beginning in the freshman year. Opportunities for applicants with superior records vary from one college to another because of the comprehensiveness of the curricula offered at the University of Illinois. In the main, a student classified as superior has special advisers, enters special

courses or sections of courses as a freshman and as a sophomore. As a junior and senior he is encouraged to participate in special programs for majors in his department. These programs usually include individual work, seminars, and, in some cases, a senior thesis.

The Edmund J. James Scholars are selected from each freshman class entering the University of Illinois or from the currently enrolled freshmen and sophomores. A group of superior students, the James Scholars, are named in honor of one of the University's most distinguished presidents. The James Scholars have available to them resources of the University not normally utilized by the average college student. Honors courses that are consistent with the student's superior ability and that challenge his intellectual development will be made available at an increasing rate. Thus the program offers unusual opportunities for able and industrious students and provides an excellent background for graduate and professional study. A James Scholar is expected to carry at least one honors course every semester when such courses are available to him. James Scholars may be dropped from the program at their own request or for inadequate scholarship.

Although no monetary award is presently given to James Scholars, most of them are eligible for one or more of the scholarships that are available through national, state, or University sources. Consequently, students who need financial assistance should apply for monetary scholarships.

Seniors in Illinois high schools who stand in the top 10 percent of their class are eligible to apply for admission to the James Scholar Program. However, this does not mean that applications of students from high schools in other states are not considered. Students who have already graduated are eligible as entering freshmen, and some students not initially chosen as freshmen may be added to the program up to the end of the third semester.

The final selection of James Scholars takes into consideration high school grades, performance in aptitude and achievement tests, other test scores, and the recommendation of high school principals and counselors. Results of the ACT Test (American College Testing Program Examination) are most important in determining eligibility for designation as a James Scholar.

Further information about the James Scholar Program and application for designation as such may be obtained by addressing the Associate Director, University Honors Programs, Room 1208 University Hall, Chicago Circle, Box 4348, Chicago, Illinois. 60680.

Honors are awarded to outstanding students at Chicago Circle. Women who earn an average of 4.5 in 15 hours of academic work during their first semester or an average of 4.5 in 30 hours during their first year may be initiated into Alpha Lambda Delta. Men whose average is 4.5 based upon 12 or more hours in the first semester or 4.5 for the entire freshman year are eligible for membership in Phi Eta Sigma.

Additional honors include the Ernest C. Van Keuren award for excel-

lence in the humanities, the B. B. Freud award for excellence in chemistry, the Roscoe E. Harris award for excellence in physics, and the Dean's List of the individual colleges.

Honors Day is observed at Chicago Circle as an occasion upon which public recognition is given those students who excel in scholarship. The families and friends of the honor students are invited to attend the annual convocation, in which these students and the faculty participate. The name of each student to whom honors has been awarded is listed in the printed program, as are the names of those students elected to the honor societies that meet the standard of scholarship approved by the Senate Committee on Honors.

Two types of honors are awarded: Class Honors and College Honors. To be eligible for Class Honors a student must be in the highest 10 percent of his class in his college and have no less than a 4.0 average. To be awarded College Honors, a student must be in the highest 3 percent of the class and have a minimum average of 4.5.

The Freshman Core Program. The goal of the program is concentration of effort and depth in learning through methods adapted to superior students and through integration of its course offerings. The program, which extends through the entire freshman year, includes Humanities 106, 107, and 108; a choice of German 121, 122, and 123 or French 121, 122, and 123; and special sections of Rhetoric 101 and 102 and of History 115, 116, and 117. The humanities and the history courses are correlated. The rhetoric and language courses also present common topics simultaneously where possible. Rhetoric is correlated with the courses in language, history, and humanities. At the end of the year the student will have satisfied graduation requirements in rhetoric, the humanities, and the social sciences and will have completed the equivalent of four quarters of a foreign language not previously studied.

Anyone who ranks in the top 10 percent of his high school class may apply. Applicants with sufficiently high scores on the ACT or SAT examinations will be admitted to a further qualifying examination to test linguistic aptitude. Sophomores may be admitted if the Core Program Committee consents.

Students are admitted to the program in the fall quarter only and are expected to continue for the entire year.

The Speech Clinic

Students who wish assistance in correcting speech difficulties, including those arising from foreign accents, hearing deficiencies, and vocal or articulatory problems, should avail themselves of the services of this clinic. There are no fees for these services.

The Talented Student Program for Illinois High School Seniors

Upon completion of the junior year, superior students who can meet University requirements may attend University classes for college credit in all four quarters at Chicago Circle and for the summer, fall, and spring sessions at Urbana or they may enroll for college credit in extramural courses or in correspondence courses offered by the Division of University Extension. To be eligible for such enrollment, the student must be recommended by his high school principal. Each case is considered individually, and the Dean of Admissions and Records, the Dean of the college concerned, and the department offering the course must concur in the high school's recommendation as the condition for acceptance.

Normally, such work taken at the University of Illinois should not be used to accelerate the high school work of a secondary-school student but should be used as a means of broadening and enriching the student's educational program. These students are expected to complete all high school courses required for graduation. The courses taken at the University by superior high school seniors are over and above the regular secondary-school curriculum.

Grades and course credits are recorded on the student's permanent University of Illinois record and appear on any official transcript issued to or for him. If the student enters the University after being graduated from high school, the courses are credited toward University graduation if they are applicable to the chosen degree program.

Students applying for admission to extramural or resident courses under the provisions of this program should arrange for the following materials to reach the Office of Admissions and Records within the deadline periods established for other admissions:

1. A completed application for admission.
2. An official copy of the high school transcript covering all work thus far completed in high school and a record of courses in progress (if applicable). This transcript should be accompanied by any test scores available on such examinations as those conducted by the College Entrance Examination Board and the American College Testing Program (ACT). However, these tests are not required.

Students interested in correspondence study should write directly to the Director of Correspondence Courses, Division of University Extension, 247 Illini Hall, Champaign, Illinois, for their application instructions at least two weeks prior to the beginning of any session in which they wish to pursue correspondence study. For the summer months, applications should be submitted no later than the middle of May.

For applications and information for prospective students for this program of study, inquiry should be made to the Dean of Admissions and Records, University of Illinois, Urbana, Illinois, or to the Associate Dean

of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

The Library

The University Library provides those books, periodicals, and related materials required to meet the instructional needs of the student. Library collections also contain materials necessary to keep the faculty informed in their respective fields of interest and scholarly activity.

At present, the book collection totals over 120,000 carefully selected volumes, including some 16,000 volumes of bound periodicals. More than 1,350 periodical titles are currently received. The Library has been a depository for United States government documents since 1957 and now contains some 40,000 items. The map collection contains more than 25,000 topographical, army, and state highway maps. Numerous materials are available in microfilm or microprint.

Materials placed in the reserve collection are located on the first floor. General periodicals, books in the fields of bibliography, religion, psychology, and philosophy, together with government documents, are shelved on the second floor. Also on the third floor are maps, rare books, and microfilms and microfilm readers. Books and periodicals in the fine arts and in the pure and applied sciences are shelved on the fourth floor, as are facilities for listening to records and tapes.

The Computer Program

Because the University recognizes that familiarity with the potentials and uses of a basic computer system is fundamental in the education of students in many fields of specialization, the Computer Program was developed as an adjunct to teaching.

The basic equipment is an IBM 1620 computer coupled to a 1311 disk file. The storage capacity is 40,000 in the core and 2,000,000 in the disk file. Auxiliary equipment includes a printer, a high-speed sorter, a reproducing punch, and printing key punches.

When the equipment is not being used for classwork, it is available for staff and student use on problems apart from class assignments.

The Office of Instructional Resources

The Office of Instructional Resources is the agency responsible for planning, developing, and, when appropriate, administering technological aids to instruction and for advising and assisting faculty in using these aids to improve the effectiveness and efficiency of instruction.

The Programed Instruction Division works with faculty members in developing programed instruction for academic courses and in locating and using programed materials from outside sources. The Television Division produces and distributes instructional television presentations and supports other television applications in teaching. The Audio-Visual Division operates a media information and projection service and a professional and a faculty "do-it-yourself" facility for making slides, overhead transparencies, and handouts. The Graphic Arts Division does art work for television and projected media and designs faculty publications, instructional exhibits, and models.

The Office of Instructional Resources is housed in the Library.

Hospital-Medical-Surgical Insurance

All students enrolled and in attendance at Chicago Circle are covered by this insurance, for which they pay a fee at registration. Eligible dependents of insured students (spouse and/or unmarried dependent children under nineteen years of age) may also be insured if the student makes application to the University Cashier (4th Floor University Hall) within the time specified by the insurance policy.

Students enrolled in the spring quarter may elect to take the insurance for the entire summer vacation period by making application to the University Cashier between May 15 and the fifth day of instruction in the summer quarter. The insured student's eligible dependents may also be included in this coverage.

Students enrolling in the summer quarter and assessed the hospital-medical-surgical insurance fee are covered only through the last day of regularly scheduled examinations of that summer quarter and not for the entire summer. Extension of the insurance to full summer coverage is secured only by application to the University Cashier on or before the fifth day of instruction in the summer quarter.

Payment claims must be initiated in the Student Insurance Office in Room 400 University Hall. See page 64 for additional information.

The Reserve Officers' Training Corps

The principal objective of the Reserve Officer Training Corps program is to develop commissioned officers for the Army Reserve and the Regular Army. It is specifically designed to enable potential leaders to prepare themselves for effective service in the Army and also offers individuals training in developing the essential qualities of leadership required to achieve success in either a civilian or military career.

Participation in the R.O.T.C. program is offered on a voluntary basis to

qualified male students. Qualifications for enrollment are:

1. U.S. Citizenship. Noncitizens may pursue the course if they present written evidence of intent to become a citizen.
2. Classification as a full-time student.
3. Age from 14 to 23 years, and can qualify for an appointment as a second lieutenant prior to reaching 28 years of age.
4. Successful physical examination.

Program of Instruction. College level R.O.T.C. instruction is offered to the qualified male student on a voluntary basis through two programs, a four-year program and a two-year program. The four-year college-level R.O.T.C. program is divided into two parts: the Basic Course, which comprises the first two years of the program, and the Advanced Course, which comprises the last two years of the program. The two-year program consists of six weeks training at summer camp (between the sophomore and junior years), and the two-year Advanced Course.

Basic Course: Freshman and Sophomore Years. The first two years of military training are designated as the Basic Course. Freshmen devote two hours a week to military instruction which consists of one hour of theory and one hour of drill. In addition, the student must enroll in a nonmilitary course that falls in one of the following four categories: effective communication, science comprehension, general psychology, political development and political institutions. This course may be one required for graduation



in the student's curriculum. The sophomore year consists of three hours of classroom instruction and one hour of drill in the fall quarter, two hours of classroom instruction and one hour of drill in the winter quarter, and one hour of classroom and one hour of drill in the spring quarter. Both the freshman and the sophomore course carry one credit for each hour of classroom instruction per quarter.

A student entering the university after successfully completing military training in a high school or preparatory school that has an accredited Junior Division R.O.T.C. program will be entitled, upon enrollment, to such placement as may be determined by the professor of military science. However, in no case will this placement exceed the first year of the basic course. Active duty may be substituted at the rate of six months active duty for each year of the basic course.

Students receive, at government expense, a uniform, textbooks, and equipment on a loan basis. A deposit of \$10 is required prior to issue of equipment. This deposit is refundable at the close of the school year when the equipment is returned.

Advanced Course: Junior and Senior Years. All students who have successfully completed the basic course and who meet the physical and academic requirements are eligible for selection for the advanced course. All students selected to participate in the two-year program and who successfully complete summer camp may enroll in the advanced course.

Each advanced-course student must attend an R.O.T.C. camp during his period of enrollment, normally between his junior and senior years.

A retainer fee of \$40 to \$50 per month is paid to each student enrolled in the advanced course except during attendance at R.O.T.C. camp. While attending R.O.T.C. camp the student is paid at the same rate as is a cadet or a midshipman in the United States military academies (\$120.60 per month), plus travel to and from camp at government expense. In addition, meals, housing, medical care, uniforms, and all equipment are furnished without charge.

Commissioning. Upon successful completion of the advanced course and completion of the degree requirements, students will be commissioned as second lieutenants in the United States Army Reserve, and a few will be offered a commission in the Regular Army. The student may select from the following list the branch of the Army in which he desires to serve.

Adjutant General's Corps	Medical Service Corps
Armor	Military Intelligence
Army Security Agency	Military Police Corps
Artillery	Ordnance Corps
Chemical Corps	Quartermaster Corps
Corps of Engineers	Signal Corps
Finance Corps	Transportation Corps
Infantry	

Deferment from selective service is granted until completion of the R.O.T.C. program to those students who are qualified and are approved by a deferment board composed of military and civilian faculty personnel. If they maintain the required standards, students will retain their deferment throughout their course in military science.



Admission to the University

As a state-supported, comprehensive university, the University of Illinois seeks to provide a higher education for those who will profit from an intellectually challenging program. The admission requirements are designed to identify those who possess the scholastic ability and maturity needed to succeed in and benefit from such an atmosphere.

A qualified applicant seeking admission as a full-time degree candidate may enter any College or Division of the University, with the exception of the College of Architecture and Art, at the beginning of any quarter. Applicants for the College of Architecture and Art may be admitted only at the beginning of the fall and spring quarters. Students registering in the summer session (as distinguished from the summer quarter) may not automatically continue in the fall quarter: they must reapply for admission.

Admission Requirements

A beginning freshman must meet two sets of requirements: the general University admission requirements (below) and the requirements of the College or Division he wishes to enter.

The General University Requirements

Age: 16 years or older

Scholastic Rank: Graduation from an accredited high school in the upper half of the class or sufficiently high test scores. Nonresidents of Illinois: Top quarter of the high school class.

Units of Credit: 15 units distributed as follows:

- 3 units of English—only courses in the history and appreciation of literature, composition (including oral composition if it is a part of a basic English course), and grammar are acceptable.
- 6 units, including a 3-unit major and a 2-unit minor in different academic fields chosen from the following (the major-minor requirement is waived for an applicant in the upper half of his high school class or with sufficiently high test scores):

Foreign Language—2 or 3 units in a single language.

Mathematics—courses in college preparatory mathematics, including algebra, geometry, trigonometry, and more advanced courses. (General mathematics will be accepted if the content is essentially the same as that covered in algebra and geometry. Commercial arithmetic, business mathematics, essentials of

mathematics, and shop mathematics will not be accepted.)

Science—astronomy, biology, botany, chemistry, general science, geology, physics, physiography, physiology, and zoology. (A major must include at least 2 units from one or more of the following: biology, botany, chemistry, physics, or zoology.)

Social Studies—history (United States, ancient, medieval, modern, and others) and general social studies (civics, economics, economic or world geography, political science, psychology, and sociology). A major in social studies must include at least 2 units of history; a minor, 1 unit.

6 units in subjects accepted by the high school toward its diploma.

Transfer Students. A transfer student (one who has completed, with passing or failing grades, 18 or more quarter hours of university-level work before applying for admission to Chicago Circle) must meet all the requirements for beginning freshmen (except those for high school rank and test scores) and the following:

1. Through spring quarter, 1966, present a cumulative college scholastic average of 3.0 (C).
2. Effective June 1, 1966:
 - A. A minimum pretransfer grade point average of 3.25. (A resident of Illinois whose average is above 3.0 but below 3.25 may be admitted by petition if the dean of the college he wishes to enter and the Dean of Admissions and Records approve.)
 - B. A nonresident of Illinois whose scholastic average is less than 3.25 will not be admitted.

Some of the Colleges and Divisions have established higher requirements for admission and continuation in certain curricula. Refer to the Admissions Chart, page 50. Transfer grades, whether acceptable for graduation or not, are included in computing the transfer student's average for admission.

Foreign Students. Students from countries in which the native language is not English must pass the English proficiency examination given by the English Language Institute of the University of Michigan, Ann Arbor, Michigan, in addition to meeting the general University and the College or Division requirements.



Admission to the University

SCHOLASTIC AND SUBJECT REQUIREMENTS

Colleges and Curricula

COLLEGE OF ARCHITECTURE AND ART

Architecture

High School Rank

Residents
Upper 1/2 or
sufficiently
high test scores
Nonresidents
Upper 1/2
(Top 1/4, effective
June, 1966)

Transfer Average

3.25

Special Requirements

Subjects Required for Admission Through Spring Quarter, 1966

*Algebra, 2 units
Geometry, 1 unit
*Trigonometry,
1/2 unit
*One foreign language, 2 units
Laboratory science, 2 units
(except general science)
Social studies,
2 units
*Students with deficiencies in advanced mathematics and foreign language may be admitted on condition the deficiencies are removed during the first year and first two years, respectively.

Subjects Required for Admission Effective June, 1966

English, 3 units
Mathematics (algebra, plane geometry, trigonometry) 3 1/2 units
One foreign language, 2 units
One or more units in each of the following for a total of 4 units
Science (except general science)
Social studies

Art

Art Design
Art History
Plastic and Graphic Arts

3.0
(3.25, effective June, 1966)

One foreign language, 2 units
(Students graduated from high schools which do not offer a foreign language may be admitted without such a language upon recommendation of the dean of the college.)

English, 3 units
Mathematics (algebra, plane geometry), 2 units
One foreign language, 2 units
One or more units in at least two of the following for a total of 5 units
Foreign language (in addition to the 2 required units)
Mathematics (in addition to the 2 required units)
Science (except general science)
Social studies

COLLEGE OF BUSINESS ADMINISTRATION

<p>DIVISION OF EDUCATION Curricula Preparatory to the Elementary School</p>	<p>Residents Upper ½ sufficiently high test scores Nonresidents Upper ½; (Top ¼, effective June, 1966)</p>	<p>3.0 (3.25, effective June, 1966)</p>	<p>*Algebra, 2 units Geometry, 1 unit One foreign language, 2 units Laboratory science (except general science) 2 units Social studies, 2 units *Students deficient in advanced mathematics and foreign language may be admitted on the condition the deficiencies are removed during the first year and the first two years, respectively.</p>	<p>General Admission requirements</p>	<p>English, 3 units Mathematics (algebra, plane geometry) 3 units One foreign language, 2 units Science (except general science), 2 units Social studies, 2 units</p>
<p>DIVISION OF EDUCATION Curricula Preparatory to Teaching in the Elementary School</p>	<p>Residents Upper ½, or sufficiently high test scores Nonresidents Upper ½ (Top ¼, effective June, 1966)</p>	<p>3.3 (3.5 after 67 quarter hours)</p>	<p>Recommendation from the Director of the Division of Education</p>	<p>General Admission requirements</p>	<p>English, 3 units Mathematics (algebra, plane geometry), 2 units One or more units in at least three of the following for a total of 7 units One foreign language (minimum of 2 units) Mathematics (in addition to the 2 required units) Science (except general science) Social studies</p>
<p>Teaching of Mentally Handicapped Children, Teaching of Deaf and Hard-of-Hearing Children.</p>	<p>Residents Top ¼ or sufficiently high test scores Nonresidents Top ¼</p>	<p>3.5</p>		<p>General Admission requirements and Algebra, 1 unit Geometry, 1 unit</p>	<p>Curricula discontinued</p>

SCHOLASTIC AND SUBJECT REQUIREMENTS Colleges and Curricula

COLLEGE OF ENGINEERING

Energy Engineering
Information Engineering
Materials Engineering
Physics
Systems Engineering
Teacher Education—Physics

High School Rank	Transfer Average	Special Requirements	Subjects Required for Admission Through Spring Quarter, 1966	Subjects Required for Admission Effective June, 1966
Residents Upper $\frac{1}{2}$ or sufficiently high test scores Nonresidents Upper $\frac{1}{2}$; (Top $\frac{1}{4}$, effective June, 1966)	3.0 (3.25, effective June, 1966)		<p>*Algebra, 2 units Geometry, 1 unit *Trigonometry, $\frac{1}{2}$ unit</p> <p>*One foreign language, 2 units Science (except general science), 2 units</p> <p>One unit must be in physics or chemistry; the second may be in either a physical or a biological science. 2 Social studies, 2 units</p> <p>*Students with deficiencies in advanced mathematics and foreign language may be admitted on the condition the deficiencies are removed during the first year and first two years respectively.</p>	<p>English, 3 units Mathematics (algebra, plane geometry, trigonometry) $3\frac{1}{2}$ units</p> <p>One foreign language, 2 units One or more units in each of the following for a total of 4 units Science (except general science) Social studies</p>

COLLEGE OF LIBERAL ARTS AND SCIENCES

General Curriculum, majors:
 Biological Science, Chemistry, English, French, German, Geography, Geology, History, Mathematics, Music, Philosophy, Physics, Political Science, Psychology, Sociology, Spanish, Speech and Theatre
 Administration of Criminal Justice, Medical Record Administration, Medical Technology, Pre nursing, Pre pharmacy

Pre veterinary Medicine, Pre dentistry

Occupational Therapy (one year)

Secondary Education curricula:
 Biology, Chemistry, English, French, Geography, German, History, Mathematics, Political Science, Sociology, Spanish, Speech.

Chemistry

Residents
 Upper ½ or sufficiently high test scores
 Non residents
 Upper ½
 (Top ¼ effective June, 1966)

3.0
 (3.25, effective June, 1966)

3.5

3.0
 (3.25, effective June, 1966)

Recommendation from the University Health Service and the Director of Occupational Therapy.

Algebra, 1 unit Geometry, 1 unit *One foreign language, 2 units *History (except social studies), 2 units *Science (except general science), 2 units Credit in 1 additional unit in any of the above subjects or in social studies is required. If the additional unit is in a foreign language it must be the third sequential unit in the same language. Nine units in the above subject areas are required. See 1, below	English, 3 units Mathematics (algebra, plane geometry), 2 units One foreign language, 2 units One or more units in at least two of the following for a total of 5 units One foreign language (in addition to the 2 required units) Mathematics (in addition to the 2 required units) Science (except general science) Social Studies
Same as the General Curriculum, and an additional ½ unit of advanced algebra. (Students with a deficiency in advanced mathematics may be admitted on condition the deficiency is removed during the first year.)	English, 3 units Mathematics (algebra, plane geometry, trigonometry), 3½ units One foreign language, 2 units One or more units in each of the following for a total of 4 units Science (except general science) Social studies

*Any one of these requirements may be waived for students who rank in the top 25 percent of their high school class or have sufficiently high test scores if all other requirements are met and if compensatory credits have been earned in other academic fields.
 †Students who are not eligible for admission under these requirements may be considered under the requirements for 1966. See Column 6.

SCHOLASTIC AND SUBJECT REQUIREMENTS Colleges and Curricula	High School Rank	Transfer Average	Special Requirements	Subjects Required for Admission Effective June, 1966	Subjects Required for Admission Through Spring Quarter, 1966
COLLEGE OF LIBERAL ARTS AND SCIENCES					
Chemical Engineering, Physics	Residents Upper $\frac{1}{2}$ or sufficiently high test scores Nonresidents Upper $\frac{1}{2}$ (Top $\frac{1}{4}$ effective June, 1966)	3.0 (3.25, effective June, 1966)		Same as General Curriculum and 1 unit of advanced al- gebra; $\frac{1}{2}$ unit of trigonometry (Students with a de- ficiency in advanced mathematics may be admitted on condi- tion the deficiency is removed during the first year.	English, 3 units Mathematics (algebra, plane geometry, trigonometry), 3½ units One foreign language, 2 units One or more units in each of the following for a total of 4 units Science (except general sci- ence) Social studies
DIVISION OF PHYSICAL EDUCATION	Residents Upper $\frac{1}{2}$ or sufficiently high test scores Nonresidents Upper $\frac{1}{2}$ Top $\frac{1}{4}$, effective June, 1966	3.0 (3.25, effective June, 1966)	Recommendation from the Director of the Division of Physical Educa- tion	General University Admission require- ments	English, 3 units Mathematics (algebra, plane geometry), 2 units One or more units in at least three of the following for a total of 7 units One foreign language (minimum of 2 units) Mathematics (in addition to the 2 required units) Science (except general science) Social studies
Dance (1 year) Health Education (1 year) Physical Education for Men (2 years) Physical Education for Women (2 years) Recreation (1 year) Teacher Education Curricula for Men and Women (2 years)					

Substitutions for and Exemptions from the Admission Requirements Entrance Examinations. Students who do not meet the high-school-subject requirements or who have been graduated from an unaccredited secondary school may be admitted to the University by passing the University's entrance examinations. These examinations are given, without charge, in advance of registration for each quarter.

General Educational Development Tests. Veterans, persons currently serving in the Armed Forces, and civilians 19 years or older who have not graduated from high school may qualify for admission to certain curricula by passing the high school level General Educational Development Tests with satisfactory scores, provided credit from recognized sources is presented in required courses not covered by these tests.

Exception: Applicants under 19 years of age may take these tests in special cases if the Dean of Admissions and Records approves.

A nonveteran who has not graduated from high school, regardless of age, may take these tests at any time following the graduation of the class in which he would normally have graduated. Single General Educational Development Tests may be authorized to complete specific subject requirements for admission.

A person who has attended, but has not graduated from, a recognized high school, or a graduate of a recognized high school who cannot meet the general University requirements may be admitted to the University on the basis of the General Educational Development Tests, provided he has the necessary subjects required for admission to the curriculum he wishes to enter. These tests allow the following credit:

English	5	units
Mathematics	2½	units
Social studies	4	units
Natural sciences	3½	units

The above credits satisfy the University English requirement. However, the mathematics credit *does not* satisfy the algebra-geometry requirement, nor does the natural science credit satisfy the laboratory science requirement. A student who has attended an unrecognized high school by passing the General Educational Development Tests. Credits earned through General Educational Development Tests may be applied toward satisfying specific subject requirements; they may substitute for high school graduation; and they may be used to establish rank for applicants who have not graduated from high school.

Admission by Special Action.

A student who is deficient in one or more of the admission requirements may be admitted, with the approval of the Dean of Admissions and Records and the Dean of the college he wishes to enter, provided he submits evidence which clearly establishes his ability to do satisfactory work in the curriculum in which he wishes to enroll.

The 45-Hour Rule. The admission requirements covering high school graduation and specific high school subjects (except when those subjects are prerequisites for required Chicago Circle courses) may be waived for those students in the three categories below who transfer to the University with 45 or more quarter hours of credit and at least a 3.0 average (3.25 in after June, 1966) in all work attempted.

1. Transfer to the University from fully accredited junior and/or senior colleges.
2. Transfers from one college to another on the same University of Illinois campus.
3. Transfers from one campus of the University to another.

All other requirements established for the admission of a transfer student to the curriculum of his choice must be met. Some colleges of the University have established minimum average requirements higher than 3.25 for admission to some curricula.

Admission Procedures

The Progressive Admissions Plan

On each campus, the number of applicants who meet the admission requirements often exceed available facilities. To meet this contingency the Progressive Admissions Plan is used. Under this plan, admission is granted in the order of scholastic excellence; this gives top priority to the students who are the most likely to be graduated.

Each qualified applicant is assigned to one of three admission-priority classifications.

Those who qualify for Priority I are sent a notice of eligibility and a request for the \$30 permit deposit *provided enrollment capacities have not been filled*. See page 59.

Those who qualify for Priority II and Priority III are notified of their classification and of the selection date for that classification *provided enrollment capacities have not been filled*. If vacancies still exist in Priority II and III on the selection date(s), applicants will be admitted in order of scholastic excellence and to the limit of the vacancies.

Application for Admission

Application blanks may be obtained by mail, by telephone, or in person from the Office of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680. The completed application should be returned to this office. A deposit is neither requested nor accepted at this time.

When to Apply

A high school student may apply either after he graduates or during his final semester in high school. In the latter case, admission will be based on the student's cumulative performance through the end of his seventh semester, on evaluation of the courses he is taking in the eighth semester, and the probable date of his graduation, subject to confirmation upon receipt of the student's final records after graduation.

The Permit to Enter

When the applicant who has been notified of his eligibility to enter pays his \$30 deposit within the specified dates, he will receive his permit to enter the University. This permit reserves a place for the applicant, which he will confirm by taking all required placement tests, completing the medical examination, and registering for classes. In addition, he must attend an advisement and registration conference at which he will complete and submit his program request card. Instructions are enclosed with the permit to enter.

The Medical Examination

Before his first registration in the University, a student is required to complete a medical examination prescribed by the University Health Service. This examination is administered without charge by the Health Service until 15 days before registration (see Calendar, page 5), or, if the student prefers, it may be administered by his own physician at the student's expense.

After the medical examination is completed and the forms are returned to the Health Service, the student will be sent a receipt, which he must bring to his Advisement and Registration Conference.

The Placement Tests

All students, except those who have formerly been in residence on a campus of the University, are required to take placement tests in foreign language, mathematics, and chemistry; however, not all tests are required of all students. Where they are indicated, the tests insure the student's enrollment in the courses for which he is adequately prepared.

The Advisement and Registration Conference

After he takes the indicated placement tests, the student is assigned to an Advisement and Registration conference, to which his parents are also invited. While he meets for academic advising, course selection, and registration with

a representative of the Dean of the College to which he has been admitted and pays the balance of his tuition and fees, his parents will participate in discussions conducted by the representatives from the colleges and the Student Services offices and will tour the campus.

The Early Decision Plan

An Illinois resident who ranks scholastically in the top quarter of his class at the end of his junior year in high school may apply for admission at the beginning of his senior year. If he is eligible, a place will be reserved for him in the freshman class, subject to validation by his meeting all admission requirements in full by the end of his senior year. The Office of Admissions and Records will furnish detailed information about this plan upon request.

A Transfer Student from another College or University may apply while he is still enrolled elsewhere or after he has completed the courses in which he seeks transfer credit. Final decision on his admission may be delayed until he has completed work at the institution from which he plans to transfer.

Selection of College and Curriculum

After he has selected the college and curriculum for which he wishes to apply, the applicant should complete the application blank, and return it to the Office of Admissions and Records, which will acknowledge its receipt as soon as possible.

An applicant who is in doubt about the course of study he should pursue is strongly urged to participate in the guidance program of the University. The Student Counseling Service offers educational and vocational aptitude examinations to second-semester high school seniors and to high school graduates. Appointments to take these examinations may be arranged through the Office of Admissions and Records. After he completes these examinations and submits his ACT score, the applicant will receive an appointment for professional counseling. See page 34 for additional information about the guidance program.

Required Credentials

Transcript. Each applicant must arrange with the registrar of the high school from which he was graduated (or last attended) and with the registrar of each college or university he has attended (if any) to have an official transcript of his record there forwarded to the Office of Admissions and Records.

Test Scores. The American College Test (ACT) is required of all beginning freshmen and of all students transferring from other colleges who have completed, with passing or failing grades, fewer than 18 quarter hours of university-level work.

Information about where and when to take the ACT test may be obtained by writing to ACT, Central Registration Unit, 519 West Sheridan Road, McHenry, Illinois. If an applicant has not taken this examination, he may be considered for *provisional* admission on the basis of the Scholastic Aptitude Test of the College Entrance Examination Board, subject to confirmation upon receipt of his ACT score after he registers. If the tests are taken more than once, the highest score earned is used.

Service Papers. An applicant who has served on active duty in the Armed Forces of the United States must submit a photocopy of his service-separation papers.

Additional Records. If, in individual cases, additional records are needed from the applicant (such as an academic dean's recommendation, an Illinois residence clarification, or the like), the applicant will be notified by the Office of Admissions and Records.

Processing the Application

Final processing of an application by the Office of Admissions and Records does not begin until all the necessary supporting credentials and documents have been received. Applicants are urged to have these on file not later than the following dates:

<i>Quarter</i>	<i>Date</i>
Fall	March 1
Winter	November 1
Spring	January 20
Summer	May 1

Admission Decision

Because of the large number of applicants, considerable time may elapse between receipt of the application and notification about the admission action. If the application is approved, the applicant will receive either a request for the \$30 tuition-and-fee deposit or a letter indicating his priority group classification. See Progressive Admissions Plan, page 56. If his application is denied, the applicant will be notified of the reasons for his ineligibility and suggestions for possible ways to qualify for admission to a future session will be given.

Admission with Advanced Standing

Advanced standing consists of college-level credit acceptable to the University. The application of such credit toward a degree, however, is at the discretion of the Dean of the College offering the degree.

High School Mathematics Courses. The Departments of Mathematics of the University have approved the granting of credit at the college level for courses in college algebra and trigonometry offered by certain high schools if the student has earned a C grade or higher in these courses. However, if credit in the courses is needed at the high school level to meet University admission requirements, advanced standing is not granted.

The Advanced Placement Program. This program, which is administered by the College Entrance Examination Board, is designed for those high school students about to enter college who wish to demonstrate their readiness for courses more advanced than those ordinarily studied during the freshman year. Many high schools offer advanced classes in one or more of the following subjects: English, French, German, Latin, Spanish, American history, European history, biology, chemistry, mathematics and physics. The University encourages able high school students to participate in this program. National examinations in each of the foregoing subjects are prepared by joint national committees of high school and college teachers and are administered by the Educational Testing Service. They are designed to determine the point at which a student should begin his college study in a given subject. The examinations, graded by other national committees, have the following values: 5—high honors, 4—honors, 3—creditable, 2—pass, 1—fail.

The University makes these specific credit recommendations.

Humanities

English

1. Scores of 5 and 4: Four quarter hours of credit in Rhetoric 101 or 8 quarter hours of credit in Rhetoric 101 and 102, depending on the judgment of a departmental committee.
2. Scores of 3 and 2: failure.

French

1. Scores of 5, 4, and 3: Eight quarter hours of credit at the lower-division level.
2. Scores of 2: Referred to the department.

German

1. Scores of 5, 4, and 3: Eight quarter hours of credit at the lower-division level.
2. Scores of 2: Referred to the department.

Latin

1. Scores of 5 and 4: Four quarter hours of credit in Latin 105 and placement in Latin 201.
2. Scores of 3 and 2: Referred to the department.

Latin 5

1. Scores of 5 and 4: Eight quarter hours of credit for Latin 201 and 202 and placement in Latin 391.
2. Scores of 3 and 2: Referred to the department.

Spanish

1. Scores of 5, 4, and 3: Eight quarter hours of credit at the lower-division level.
2. Scores of 2: Referred to the department.

Social Studies

American History

1. Scores of 5 and 4: Credit for History 151, 152, 153 (12 quarter hours).
2. Scores of 3 and 2: Referred to the department.

European History

1. Scores of 5 and 4: Credit for History 115, 116, 117 (12 quarter hours).
2. Scores of 3 and 2 are not considered for advanced placement or credit.

Natural Sciences and Mathematics

Biological Sciences

1. Scores of 5, 4, and 3: Credit for Biological Sciences 110, 111, 112 (12 quarter hours).
2. Scores of 2: Referred to the department.

Chemistry

1. Scores of 5 and 4: Credit for three quarters of general chemistry (12 quarter hours) and permission to enroll in Chemistry 121.
2. Scores of 3: Credit for two quarters of general chemistry (8 quarter hours) and permission to enroll in Chemistry 114.
3. Scores of 2 and 1: Students should take the departmental placement examination.

Mathematics

1. Scores of 5: Credit in Mathematics 130, 131, 132, 133 (20 quarter hours) and advanced placement in any course for which Mathematics 133 is prerequisite.
2. Scores of 4: Credit in Mathematics 130, 131, 132 (15 quarter hours) and advanced placement in Mathematics 133.
3. Scores of 3: Credit in Mathematics 130, 131 (10 quarter hours) and advanced placement in Mathematics 132.

Physics

1. Scores of 5, 4, and 3: Automatic admission to a proficiency examination that covers Physics 111, 112, 113, 114 or Physics 101, 102, 103, depending on the student's curriculum. Grades of A or B on the proficiency examination on a sequence carry 19 quarter hours for the Physics 111, 112, 113, 114 sequence; 15 quarter hours for the Physics 101, 102, 103 sequence. A grade of C: Consult the Department of Physics.
2. Scores of 2: With the approval of the Department of Physics, students may write a proficiency examination in any one of the courses in the sequences listed in 1. Credit will be allowed only for those courses in which the student has proficiency examination grades of C or higher.

Credit From Other Institutions

Fully Accredited Institutions. Work successfully completed in other fully accredited collegiate institutions which have been approved by one of the regional accrediting associations is generally accepted by the University on an hour-for-hour basis, as shown on the official transcripts of records received from those institutions. Students who transfer from degree-granting insti-

tutions not so accredited but which are accredited or approved by one of the agencies recognized by the National Commission on Accrediting may also be allowed credit for work taken at those institutions.

Provisionally Accredited Institutions. Credit from institutions with provisional accreditation is accepted on a deferred basis until it is validated by satisfactory completion of additional work taken in residence at the University or in another fully accredited institution.

Unaccredited Institutions. Credit from unaccredited institutions is not accepted. However, credit in courses taken in such institutions may be established by proficiency examination at the University after the student has enrolled.

Junior College Credit. The foregoing conditions governing acceptance of credit also apply to junior colleges, with this exception: through the 1965-1966 academic year, credit earned in a junior college after a student has earned 99 quarter hours of credit (excluding credit in physical education and military science) will not be accepted. Effective with admission to sessions beginning June 1, 1966, and later, credit transferred from a junior college is limited only by the provision that the student must earn the last 90 quarter hours required for the degree at the University or at any other approved four-year institution, except that the student must meet the residence requirements for a degree from the University of Illinois. When a school or college requires three years of preprofessional college credit for admission, at least the last 45 quarter hours must be taken in an approved four-year collegiate institution.

Military Service Credit

Completion of not less than six months of extended active duty in any branch of the Armed Forces of the United States entitles an applicant to six quarter hours of credit in physical education and six quarter hours in basic military science if the applicant has been honorably separated from such military service.

Credit is also allowed for those United States Armed Forces Institute (USAFI) courses for which the American Council on Education recommends credit at the baccalaureate level, provided the student has passed the appropriate USAFI end-of-course test or examination.

Credit for service schools successfully completed and for other courses taken while the student was in service may be allowed after evaluation by the Office of Admissions and Records.

No credit is allowed for the college-level General Educational Development Tests.

Proficiency Examinations

Each quarter, the University gives proficiency examinations, similar to regular quarter examinations, in courses ordinarily open to freshmen and sophomores. For Rhetoric 101 and 102, proficiency examinations are regularly scheduled. In other subjects, the student must obtain the consent of the head or chairman of the department concerned. Proficiency examinations in more advanced undergraduate subjects may also be given if the head or chairman of the department recommends and the dean of the college concerned approves. There is no fee for these examinations.

The grade given in the proficiency examinations is either "pass" or "fail," but no student receives a "pass" unless he has made at least a C grade. Neither grade is included in the computation of the student's average, and no official record is made of a "fail."

A student who passes a proficiency examination is given the amount of credit toward graduation regularly allowed in the course if the course is acceptable in his curriculum. However, if such credit duplicates credit counted for his admission to the University, it is not allowed. Proficiency examinations are given only to:

1. Persons who are in residence.
2. Persons who, after having been in residence, are currently registered in a correspondence course.
3. Persons who are degree candidates at the University and need no more than 15 quarter hours to complete their degree requirements.

Proficiency examinations may *not* be taken:

1. By students who have received credit for more than one quarter of work in the subject in advance of the course in which the examination is requested.
2. To raise grades or to remove failures in courses.
3. In a course the student has attended as a listener or a visitor.

Tuition and Fees

Tuition and fees are due and payable in full when the student registers. However, in certain cases, arrangements may be made with the Business Office to defer payment. The amount of the tuition and fees varies, depending on the number of credit hours for which the student has registered and on his residence status.

TUITION AND FEES—CHICAGO CIRCLE

PER QUARTER	<i>Full Program</i>		<i>Partial Program</i>			
	Range I		Range II		Range III	
	Above 10 quarter hours		Above 5 to 10 quarter hours		Above 0 to 5 quarter hours	
	Resident	Non- resident	Resident	Non- resident	Resident	Non- resident
Tuition (except those hold- ing exemptions	\$57.00	\$250.00	\$40.00	\$175.00	\$25.00	\$ 90.00
Service Fee	34.00	34.00	26.00	26.00	16.00	16.00
Hospital-Medical Insurance Fee	6.00	6.00	6.00	6.00	6.00	6.00
Total	\$97.00	\$290.00	\$72.00	\$207.00	\$47.00	\$112.00

Deposits, Additional Fees, and Refunds

One or more of the following deposits and additional fees and/or charges will be assessed if applicable.

The Tuition-And-Fee Deposit reserves the applicant a place in the entering class. When the tuition-and-fee deposit is paid, the applicant will receive a permit to enter.

The General Deposit of \$5 is assessed at registration and covers the cost of such items as unreturned towels, lost library books, unpaid library fines, lost or broken laboratory equipment, and like items. Whenever such costs cause the balance to fall below \$2.50, the student is immediately required to restore the total to \$5. At each succeeding registration, the student is assessed the difference between the balance in his account and \$5 to assure a total of \$5 in the account at the beginning of each quarter. If the student officially withdraws from the University, any balance remaining in his account is refunded to him after the close of registration for the next quarter following his withdrawal.

The Military Deposit of \$10 is assessed each student withdrawing military equipment. The deposit is refunded to the student upon the return of the equipment at the end of each school year or upon his withdrawal from the University.

The Hospital-Medical-Surgical Fee is assessed all students. However, if a student presents evidence of insurance in force which provides him equivalent coverage, he may petition, through the Office of Student Affairs, for a refund of this fee. He must also consult the Office of Student Affairs about the time limit for such refunds. Refunds are not given on any other basis. If a student withdraws from the University, he remains insured for the balance of the quarter from which he withdrew. (For the exact termination date, the student should refer to the insurance certificate given him at regis-

tration or call the University Insurance Office.) Special provisions exist for students to be covered by this insurance during the summer months, whether or not they are registered.

The Service Fee is assessed all students and is used to cover the operating expenses of Chicago Circle Center; the financing for the Center building, and the Student Activities Program. This fee entitles the student to use the Center building and to attend all Chicago Circle plays, concerts, cinema series, forum series, and varsity games without further charge.

The Lost-Identification-Card Fee. When the student pays his tuition and fees each quarter, he receives an identification card to use in obtaining library books and lockers, towels, and other equipment. The charge for replacing a lost or destroyed identification card is -----\$.50.

The Deferred-Fee Charge is made when arrangements have been made with the Business Office to defer payment of fees. For this privilege, the nonrefundable charge, which must be paid on the day the deferment agreement is made, is -----\$2.

Change-of-Program Fee. For each change-of-program slip issued at the request of the student the fee is -----\$1.

Course-Visitor Fee. The privilege of attending classes as a visitor is granted only by permission of the instructor of the class, with the approval of the dean of the college concerned. A visitor may not write examinations for credit in courses which he has visited; he may not visit laboratory courses. A student in Range I is not assessed a visitor's fee. For all others, the visitor's fee for each course is -----\$15.

Noncredit-Course Fee. Students in Range I of the tuition-and-fee schedule are not charged for noncredit courses taken in addition to their regular program. Students in Range II or Range III of the tuition-and-fee schedule pay \$15 for each noncredit course taken in addition to their regular program. Persons registering only in noncredit courses will be assessed Range III tuition and fees.

Special-Examination Fee. For a special examination given in a course which has been failed, the fee is -----\$10.

Transcript Fee. Each student who has paid all his University fees is entitled to receive one transcript of his record without charge. For each additional transcript, the fee is -----\$1.

Late-Registration Fine. All students who complete registration after classes have begun must pay the late-registration fine of -----\$15.

On Withdrawal from the University. The full amount of tuition and fees assessed, *except for the \$30 nonrefundable deposit*, is refunded to students who withdraw from the University within the first ten days of instruction of a quarter. After the tenth day of instruction and before the middle of the quarter, one-half of the amount assessed, *except for the nonrefundable deposit*, is refunded. After the middle of the quarter no refund is issued. If the total assessment was less than \$30 (for example, a student on a tuition-waiver scholarship), no refund is issued.

On Withdrawal from a Course. A student whose withdrawal from one or more courses results in a reduction in program to a lower tuition and fee range receives a refund of the full amount of the difference between the two ranges if his course withdrawal occurs during the full rebate period. Half the amount of the difference is refunded when withdrawal occurs during the half-rebate period. No refund is issued if his withdrawal occurs thereafter.

Withdrawal of a Visitor. A visitor who withdraws from one or more courses *within ten days after paying his fees* will receive a full refund. Thereafter, no refund will be issued.

General University Requirements

The academic year consists of two semesters (Urbana) or three quarters (Chicago Circle and the Medical Center). Requirements are generally stated in terms of full-time programs. Semester hours are converted to quarter hours by multiplying by $3/2$. Quarter hours are converted by multiplying by $2/3$.

Regardless of the college and curriculum in which he is enrolled, there are specific University requirements that each student must fulfill if he is to be graduated.

1. He must meet the admission requirements.
2. He must remove all deficiencies in entrance credit.
3. He must demonstrate that he is proficient in written English by earning grades of A or B in Rhetoric 102 or by passing a proficiency examination or the equivalent. Literature courses do not constitute an equivalent. If his grade in Rhetoric 102 is C or D, he must pass either the English Qualifying Examination or Rhetoric 200, a non-credit course. A degree will not be granted unless one of the above conditions is met. A transfer student may be certified by the Office of Admissions and Records as exempt without credit from the equivalent of Rhetoric 102.
4. He must earn six quarters of credit in physical education unless he is a transfer student with 90 or more quarter hours of transfer credit.
5. He must fulfill the general education requirements of a minimum of 12 hours in the humanities, 12 hours in social science, and 12 hours in natural science. The general education courses, which must be taken in approved sequences, determined in consultation with the appropriate college office, provide a broad educational base for the major and minor (Liberal Arts and Sciences), for a field of specialization (Business Administration), for the selected option (Art and Architecture, Engineering), or for work in the Divisions of Education and Physical Education.
6. He must meet all of the graduation requirements of the college in which he is enrolled.

7. He must earn the required grade-point average of 3.0 in all courses offered for the degree and in all courses taken at the University of Illinois.
8. He must satisfy the residence requirement: Either the first 135 quarter hours or the last 45 quarter hours of University work must be taken at Chicago Circle.

In addition to the foregoing, there are specific college requirements to be met; they are listed in the sections of this Catalog devoted to the colleges.

Quarter Hours

A University quarter hour represents one classroom hour of fifty minutes weekly for one quarter, in lecture or recitation, and either the necessary preparation time or a longer time in laboratory or other exercises. It is expected that most students will spend two hours preparation for one hour per week of lecture or recitation. Each University quarter hour of credit is thus understood to represent at least three hours of the student's time, and the credit value of a course is calculated in quarter hours on that basis. The number of quarter hours allotted each course is listed immediately after the course title in the "Courses of Instruction" section of this Catalog. "Engl. 113. American Literature, I. 4 hours" is an example. The number of quarter hours earned by the student determines, during his undergraduate period, his classification within the University.

45 quarter hours = sophomore standing

90 quarter hours = junior standing

135 quarter hours = senior standing

Note: 180 quarter hours constitute the minimum required for a degree. The required number of hours varies within the colleges and curricula. The student should refer to the section of this Catalog covering his college and curriculum to determine the hour requirement for his particular degree. His college office will also provide this information.

The Grading and Grade-Point Systems of the University

These systems should be thoroughly understood by each student seeking a degree. Six grades and three symbols are used.

Grades:

A = Excellent

B = Good

C = Fair

D = Poor

E = Failure

Ab = Failure because of
absence from the
final examination
without excuse

Symbols:

W = Withdrawn, without penalty, from the course

Ex = Excused from the final examination; status
undetermined until the examination is written

Rep = Replaces Ex when the student repeats the
course for which the Ex was received

Grade-Points. Each grade has a specific value, which is expressed in grade points. When the grade-point average is computed, the following weights, or values, are used for each grade:

A = 5 grade points

C = 3 grade points

B = 4 grade points

D = 2 grade points

Ab and E — 1 grade point each

Computing the Grade-Point Average. Multiply the number of hours of each grade by the weight, add the products, and divide by the number of hours. Below is a typical grade-point computation for a student who has earned 3 hours of A, 6 hours of B, 3 hours of C, 2 hours of D, and 4 hours of E.

Grade	Hours	Weight	Grade Points	
A	3	5	15	
B	6	4	24	
C	3	3	9	
D	2	2	4	
E	4	1	4	
	<hr/> 18		<hr/> 56	$\frac{56}{18} = 3.11$

The student's grade-point average is 3.11.

Electives

The terms "restricted electives" and "free electives" should also be understood thoroughly.

Restricted Electives. While they differ from required courses, which must be taken by all students in a given curriculum, some electives are nevertheless restricted in scope and pertain to an area within which limited choice is permitted. For example, electives in general education are restricted to approved sequences.

Free Electives. After the University and the college requirements for graduation have been fulfilled, the student may still need to enroll in additional courses to earn the minimum number of hours needed for his degree. These additional hours are earned by enrolling in courses classified as free electives for those for whom they are not required. The value of free electives lies in the further broadening they provide for the student's total education.

Transfer and Withdrawal

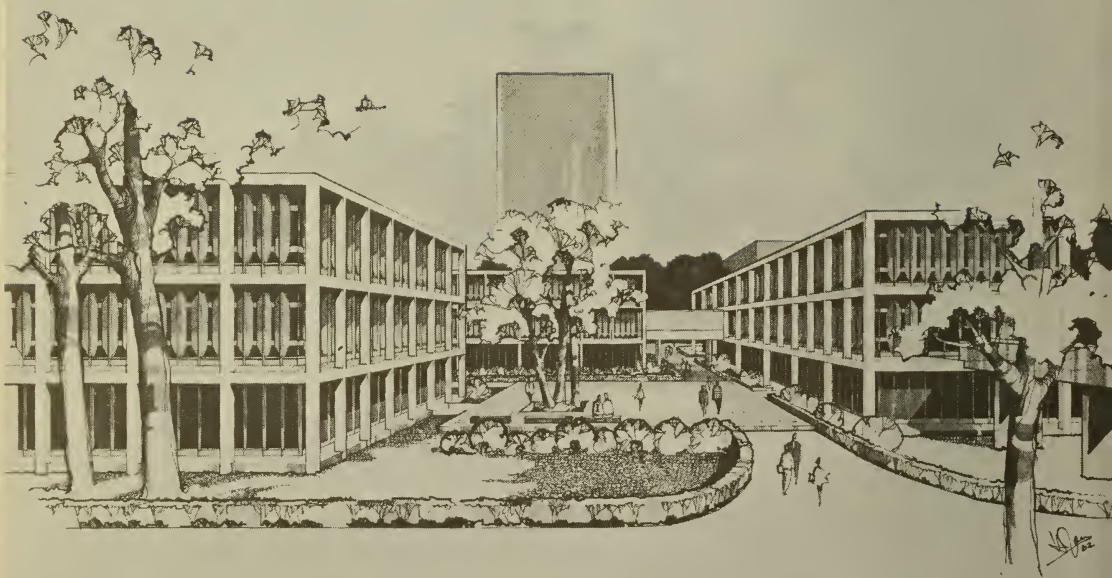
Transfer to and from Urbana is governed by specific regulations. Since Urbana is on the semester system, and Chicago Circle is on the quarter system, such transfer is most easily made at the end of the student's year. A student at Chicago Circle who intends to transfer to Urbana may do so by securing a release from the dean of the college in which he is enrolled. This release is then presented to the Office of Admissions and Records; this office will transfer the necessary records to Urbana for processing.

A student who transfers to Urbana for the fall semester must comply with the Urbana application deadline.

A student at Urbana who wishes to transfer to Chicago Circle should obtain a copy of the Chicago Circle Application from the Office of Admissions and Records at Urbana or at Chicago.

Withdrawal from the University is also governed by specific regulations that the student should observe to protect his academic standing. A student who leaves the University before the end of a session must obtain withdrawal papers from the office of the college in which he is enrolled. If he does not do so, he will be failed in all courses and will be on dropped-for-poor-scholarship status at the end of the quarter.

The Colleges and Divisions



The College of Architecture and Art

The College of Architecture and Art serves as a center for study and investigation in the visual and plastic arts and offers professional curricula in architecture and in several specialized areas. Emphasis is on the creative process within a broadly cultural educational program. Architecture and the arts are considered in their social context as a reflection of the highest aspirations of contemporary culture and as expressions that give meaning and purpose to human life. Principles and methodology are stressed rather than resultant form and changing styles.

The Department of Architecture

The curriculum in architecture is structured to provide the student with the initial steps in the lifelong process of qualification required to fulfill the social responsibilities of the architect.

Architecture is the art and science of building to satisfy the environmental needs of man. Within those needs, it is the architect's responsibility to analyze the inherent social, psychological, and physical factors and to translate them creatively, through the act of design, into an appropriate physical environment. Thus, as society evolves, so too does the role of the architect. Today, society has charged architecture and its codiscipline, planning, with far greater social and physical responsibilities than ever before, responsibilities that are best exemplified by the term "urbanism." The results of poverty, social disorder, and an unaccommodating environment in a rural area are quite different in impact than are these same factors in an urban environment, where they foster social, moral, and economic decay and, eventually, total cultural disintegration.

Inherent in the architect's professional success is the potential of the "good life" for the majority of the world's population and the cultural growth and development of its societies. To achieve this potential, the historical evolution of architecture is presented to the student as a matrix for the social, structural, and aesthetic aspects of the profession. The successful student learns to think for himself, to solve problems, to avoid histrionics,

and to see the world around him both as it is and as it could be. The factors implicit in architecture are numerous, weighted, variable, and inter-dependent. Hence, it is through a balanced, flexible sequence of courses in design, building technology, structures, and the humanities that the student is encouraged to identify and to place into context these many factors.

The first, or foundation, year is common for all students in the College, whether they are enrolled in architecture or in art; the second, third, and fourth years provide a common base for students in the Department of Architecture; the fifth year, during which the student completes his major and minor emphases, offers a maximum of flexibility for work in one of the following:

Architectural Humanities	Design
Building Technology	Structures

The curriculum in architecture requires 239 quarter hours for graduation, exclusive of military training and required physical education. The candidate is then eligible for recommendation for the degree of bachelor of architecture in one of the above areas.

The Curriculum in Architecture

The courses offered in the fourth (summer) quarter are identical with those offered in the second (winter) quarter.

First Year

<i>First Quarter</i>	Hours
Architecture and Art 101-Basic Design	3
Architecture and Art 111-Visual Communications, I	2
Architecture and Art 141-Man and Environment	3
Mathematics 111*-Introduction to Analysis, I	3-5
Rhetoric 101-Freshman Rhetoric and Composition	4
Physical Education	(1)
	<hr/> 15-17

<i>Second Quarter</i>	
Architecture and Art 102-Basic Design, II	3
Architecture and Art 112-Visual Communications, II	2
Architecture and Art 142-Introduction to Art History	3
Mathematics 112*-Introduction to Analysis, II	3-5
Rhetoric 102-Freshman Composition and Rhetoric	4
Physical Education	(1)
	<hr/> 15-17

<i>Third Quarter</i>	
Architecture and Art 103-Basic Design, III	3
Architecture and Art 113-Visual Communications, III	2
Architecture and Art 143-Art History Survey, I	3
Mathematics 194*-Introduction to Automatic Digital Computing	3-5
Elective (social science or humanities)	3-4
Physical Education	(1)
	<hr/> 14-15

*Required for all students who elect a structures major. Mathematics 130, 131, 132, 133 may be substituted for 111, 112, 194.

Second Year

First Quarter

Architecture and Art 104-Basic Design, IV	3
Architecture and Art 114-Visual Communications, IV	2
Architecture 121-Statics and Strength of Materials, I	3
Architecture and Art 144-Art History Survey, II	3
Physics 101-Mechanics	5
Physical Education	(1)
	<hr/> 16

Second Quarter

Architecture 101-Architectural Design	6
Architecture 122-Statics and Strength of Materials, II	3
Elective-From Architecture 231-238	3
Physics 102-Heat, Sound, Light	5
Physical Education	(1)
	<hr/> 17

Third Quarter

Architecture 102-Architectural Design	6
Architecture 111-Building Technology, I	4
Architecture 123-Statics and Strength of Materials, III	3
Physics 103-Electricity and Magnetism	5
Physical Education	(1)

Third Year

First Quarter

Architecture 201-Architectural Design	6
Architecture 211-Building Technology, II	4
Architecture 221-Structural Engineering, I	3
Sociology 100-Introduction to Sociology	4
	<hr/> 17

Second Quarter

Architecture 212-Building Technology, III	4
Architecture 222-Structural Engineering, II	3
Art Elective(s)	5
Sociology 276-Sociology of Urban Life in Industrial Society	4
	<hr/> 16

Third Quarter

Architecture 202-Architectural Design	6
Architecture 213-Building Technology, IV	4
Architecture 223-Structural Engineering, III	3
Architecture 241-Urban and Regional Planning, I	3
	<hr/> 16

Fourth Year

First Quarter

Architecture 203-Architectural Design	6
Architecture 214-Building Technology, V	4
Architecture 224-Structural Engineering, IV	3
Architecture 242-Urban and Regional Planning, II	3
	<hr/> 16

Second Quarter

Architecture 204—Architectural Design	6
Architecture 215—Building Technology, VI	4
Architecture 225—Structural Engineering V	3
Architecture Elective from 231-238	3
	<hr/> 16

Third Quarter

Architecture 226—Structural Engineering, VI	3
Art Elective(s)	5
Architecture Elective from 231-238	3
Elective (Social science or humanities)	3-4
	<hr/> 14-15

Fifth Year

The fifth year is elective except Architecture 343. The student will take 6 hours in his elected major in the first and second quarters and will prepare a thesis in his third quarter.

First Quarter

	Hours
Architecture 231-233 ¹ , 301, 311, 312, 313, 321, 322, 323, 331, 332. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Elective (social science or humanities)	3-4
	<hr/> 15-16

Second Quarter

Architecture 231-238 ¹ , 302, 314, 315, 316, 324, 325, 326, 332, 333. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Elective (social science or humanities)	3-4
	<hr/> 15-16

¹ For students in Architectural Humanities.

Third Quarter

Architecture 309 or 319 or 329 or 339—Thesis in the student's option.	12
Architecture 343—Professional Practice	3
	<hr/> 15

Notes. For course descriptions, see page 119ff, "Courses of Instruction."

Electives: A minimum of 9 hours in social science and 9 hours in the humanities.

Courses in the College of Engineering can be substituted for equivalent structures courses in the College of Architecture if the student's adviser consents.

The Department of Art

The curricula of the Department of Art are formulated to release and develop the creative powers of the student while furthering his liberal education.

The first two years of study in the Department provide a foundation program for the student; he is not eligible for junior and senior courses until he has satisfactorily completed this program.

Foundation Program

<i>First Year</i>		<i>Second Year</i>	
Architecture and Art		Architecture and Art	
101, 102, 103	9 hours	104, 105, 106, 114, 115, 116, 144	18 hours
111, 112, 113	6	Sociology 100	4
141, 142, 143	9	Anthropology 103	4
Rhetoric 101, 102	3	Philosophy 102	4
Mathematics 115	4	Electives (art history or foreign language)	12
Psychology 100	4	Physical education	3
Elective	3-4		
Physical education	3		
<hr/>		<hr/>	
46-47		45	

The junior and senior years are devoted to study in one of the department's three areas of emphasis:

Art History	Design	Plastic and Graphic Arts
	Communications Option	Painting Option
	Industrial Design Option	Printmaking Option
	Photography-Film Option	Sculpture Option

Major in Art History

A student is not eligible for advanced courses in art history until he has completed 12 hours of intermediate art history.

184 hours (exclusive of physical education and basic military science), distributed as follows:

- 45 hours in the art courses of the two-year foundation program.
- 33 hours in art history courses.
- 18 hours in departmental courses outside the major.
- 88 hours in general education courses, electives, and the required nonart courses of the two-year foundation program.

Major in Design: Communications, Industrial Design, Photography-Film.

189 hours (exclusive of physical education and basic military science), distributed as follows:

- 45 hours in the art courses of the two-year foundation program for art students.
- 50 hours in one of the three options in design.

28 hours in departmental courses outside the major.

66 hours in general education courses, electives, and the required nonart courses of the two-year foundation program.

Balanced-Program Option in Design (elected only with the approval of the department chairman)

As above, except:

60 hours equally distributed in communications design, industrial design, and photography-film.

18 hours in departmental courses outside the design option.

Major in Plastic and Graphic Arts: Painting, Printmaking, Sculpture.

189 hours (exclusive of physical education and basic military science), distributed as follows:

45 hours in the art courses of the two-year foundation program for art students.

60 hours in art courses in the plastic and graphic arts.

18 hours in art courses in the departmental courses outside the major.

66 hours in general education courses, electives, and the required nonart courses of the two-year foundation program.

Balanced-Program Option in Plastic and Graphic Arts (elected only with the approval of the department chairman)

As above, except:

60 hours equally distributed in painting, printmaking, and sculpture.

18 hours in departmental courses outside the plastic and graphic arts.

Each curriculum is designed to provide a maximum of individual choice by means of a range of offerings that permits flexible patterns from which the student, with faculty counsel, selects programs that yield the highest degree of comprehensive skill and knowledge.

The colloquia of the junior and senior years are conducted by practicing artists and designers, who present their views on current problems and practices.

For course descriptions, see page 119ff., "Courses of Instruction."

The College of Business Administration

The College of Business Administration has shaped its curricula to promote three objectives: first, to provide its graduates with a liberal-education background; second, to equip them with a well-balanced foundation in the functional fields of business, together with a degree of competence in the use of the analytical tools of management; and, third, to enable them to acquire some specialized training in an area of concentration.

Students who entered the College of Business Administration before September 1, 1965, should consult the college office about graduation requirements.

Beginning students enrolling for the fall quarter 1965 will complete the following areas of work for the degree.

For graduation, a minimum of 186 quarter hours, including general University requirements, distributed as follows:

College and University General Education Requirements

Rhetoric 101, 102, 251	12 hours
Speech 101	5
Mathematics 110, 111, 112 ¹	11
Biology and/or Physical Science	12
Anthropology or Psychology or Sociology	8
Economics 120, 121	8
History and/or Political Science	8
Philosophy 102	4
Fine Arts	4
Electives	12
College General Education Electives ²	12
	<hr/> 96

1 *Mathematics.* A student who does not present 2 units of high school algebra and 1 unit of geometry enters with a deficiency which must be removed by the end of the freshman year. A student who enters without college credit in algebra is required to take the Mathematics Placement Test before registering in the College. The test results will determine if the student should enroll in Math. 104 (no graduation credit) or is exempt from college algebra. He will enroll in the mathematics courses required for graduation from the College if his test score shows proficiency.

The student who enters college credit in algebra and other advanced mathematics is exempt from Math. 104 and may proceed directly to required courses beyond college algebra.

2 The student should complete at least one course of the general education sequence requirements in each quarter of the first two years. The social science courses should be started not later than the sophomore year.

Foreign Language. A student who does not present two units in one foreign language for admission must make up the deficiency during the first two years.

Areas of Concentration and Electives

Accounting

Required: Accounting 300, 301, 302, 303, 304, 305, 306
Business electives¹

Economics

Required: At least one course from each area.
Area 1. Economics 324, 325, 326
*Area 2. Economics 327, 328, 329, 330, 331, 332
Area 3. Economics 333, 334
*One additional course may be taken from Area 2.
Business electives¹

Finance

Required: Finance 342, 343, 344, 345
Business electives¹

Management

Required: Management 352, 353
Business electives¹

Marketing

Required: Marketing 361, 362, 363, 364, 365
Business electives¹

Quantitative Analysis—Business Administration

Required: Quantitative Analysis—Business Administration 370, 371, 375, 376
Business electives¹

¹ Electives, approved by the faculty adviser, to bring the total hours, including the general education and the business core requirements, to a minimum of 186 hours.

A Typical Program in the College of Business Administration

Freshman Year

1st Quarter	Hours
Management 150	3
Rhetoric 101	4
Mathematics 110	5
Science	4
Physical Education	(1)
	<hr/>
	16

2nd Quarter	
Management 151	3
Rhetoric 102	4
Mathematics 111	3
Science	4
Physical Education	(1)
	<hr/>
	14

Sophomore Year

1st Quarter	Hours
Economics 120	4
Quantitative Analysis 170	3
Accounting 100	3
Behavioral Science* or History or Political Science	4
Physical Education	(1)
	<hr/>
	14

2nd Quarter	
Economics 121	4
Quantitative Analysis 171	3
Accounting 101	3
Behavioral Science* or History or Political Science	4
Physical Education	(1)
	<hr/>
	14

3rd Quarter	
Management 152	3
Philosophy 102	4
Mathematics 112	3
Science	4
Physical Education	(1)
<hr/>	
	14

Junior Year

1st Quarter	Hours
Economics 320	3
Area of Concentration or	
Elective	3-4
Marketing 260	4
Management 350	3
Behavioral Science* or	
History or Political Science	4
<hr/>	
	17-18

2nd Quarter	
Economics 321	3
Area of Concentration or	
Elective	3-4
Finance 341	3
Management 351	3
Behavioral Science* or	
History or Political Science	4
<hr/>	
	16-17

3rd Quarter	
Economics 322	3
Area of Concentration or	
Elective	6-8
Rhetoric 251	4
Fine Arts	4
<hr/>	
	17-19

3rd Quarter	
Finance 240	3
Quantitative Analysis 172	3
Accounting 102	3
Speech 101	5
Physical Education	(1)
<hr/>	
	14

Senior Year

1st Quarter	Hours
Business Law 310	4
Area of Concentration or	
Elective	3
Economics 323	3
General Education Elective	4
Humanities	4
<hr/>	
	18

2nd Quarter	
Area of Concentration or	
Elective	6
General Ed. Elective	4
Humanities	4
<hr/>	
	14

3rd Quarter	
Management 359	4
Area of Concentration or	
Elective	6
General Education Elective	4
Humanities	4
<hr/>	
	18

*Eight hours of behavioral science and 8 hours of history and/or political science are required of all students.



The Division of Education

Established to provide basic study in education, the Division offers the professional courses for students preparing to teach in the elementary and secondary schools. The courses in general education and in the area of specialization are administered by and taught in the various departments of the colleges and divisions. Students preparing to teach physical education enter the Division of Physical Education, those preparing to teach in the elementary school enter the Division of Education, those preparing to teach art enter the College of Architecture and Art (but cannot complete degree requirements at Chicago Circle), those preparing to teach physics enter the College of Engineering, and those preparing to teach other subjects in the secondary school enter the College of Liberal Arts and Sciences.

Curricula preparatory to teaching in the secondary school have been approved and junior-year work is offered in 1965-1966. The curriculum preparatory to teaching in the elementary school has been approved by the Chicago Circle Senate but awaits approval of the University Council on Teacher Education and the State Board of Higher Education. Only freshmen are admitted to this proposed curriculum during 1965-1966.

Freshmen who plan to enter secondary school curricula in Russian, speech correction, and art and curricula for teaching the deaf and hard-of-hearing and the mentally handicapped will be unable to complete degree requirements at Chicago Circle and must transfer to Urbana or elsewhere. Students beyond the freshman year in these curricula and in elementary education should also plan to transfer at the end of the sophomore year.

The University Council on Teacher Education is responsible for coordinating these teacher education programs throughout the University and for maintaining relationships with the Chicago and the State of Illinois certification authorities. On recommendation by the University to the State Teachers Certification Board, graduates of teacher education curricula are eligible for certification in Illinois outside of Chicago. Graduates generally qualify for certification in other states and are generally eligible to take the examination for Chicago also. To be eligible for graduation and recommendation for certification a student must be enrolled in an approved program in teacher education. Graduates of curricula approved by the Council on Teacher Education are eligible for admission to the graduate college of most

institutions, with majors in the student's first or second field of specialization or in the professional areas of education.

Admission Requirements

An applicant for admission to a teacher education curriculum must meet the admission requirements of the college offering the chosen curriculum. A student who is transferring to a teacher education curriculum of the University of Illinois at Chicago Circle from another curriculum, college, or institution and who has completed 67 quarter hours of credit must present a cumulative grade point average of 3.5 or more, based on a 5.0 system, for admission in good standing.

Advising Program

Each student will be assigned an adviser in his first field of specialization. For example, if he plans to teach English, he will have an adviser in the English Department who will guide him in his selection of courses preparatory to the teaching of English and to eligibility for certification. Elementary education students will have an adviser from the Division of Education.

Students who desire to enter any teaching curriculum or desire to make changes from one teacher education curriculum to another should secure permission from the Coordinator of Teacher Education, 1506 University Hall.

Advanced Standing Requirements

Continuation in teacher education curricula beyond the sophomore year is contingent on admission to advanced standing in teacher education, determined after the completion of 75 to 90 quarter hours of course work. The decision is based on the applicant's academic, personal, physical, and verbal and written communication qualifications.

Student-Teacher Application

A professional quarter of student teaching (including a seminar in evaluation) is required in the senior year. A student must apply for student teaching during the first two weeks of the quarter before the one in which he receives the assignment. Application forms may be obtained from the Office of the Director of Student Teaching, 1512 University Hall.

A student is admitted to student teaching only if he has been admitted to advanced standing in teacher education. Unless there has been deterioration in the academic or personal qualifications since he was admitted to advanced standing, a student is normally eligible for such admission. A candidate

for a degree in teacher education and for eligibility for certification must complete student teaching while he is enrolled in the University of Illinois at Chicago Circle.

Student-teaching assignments will be in the Chicago and suburban public schools. For most students, an additional expense of approximately \$75 will be incurred during the quarter in which the student teaching is scheduled.

Specialization at the Secondary Level

Each student seeking a degree and certification for teaching at the secondary level must have *two* teaching specializations. The curricula in teacher education provide for the adequate development of the major field of specialization; the minor specialization should be selected from the following teacher education list of major fields of specialization. If the student needs assistance in the selection of a program for the teacher education minor, he should consult the adviser for the major.

Curricula Preparatory to Teaching in Secondary Schools

The fields of specialization in which degrees are granted and the total number of hours required for each are listed below. This total includes the 28 hours of credit that must be earned in professional education and the 30 to 36 hours of credit that are required in the minor (second field of specialization). The total hours are exclusive of basic military science and required physical education.

Subject	Degree Awarded	General Education	Major	Electives	Total
Biology	B.S.	40-52	48	0-14	195
Chemistry	B.S.	40-64	54	0-23	190
English	B.A.	52-76	52	0-18	180
French	B.A.	52	39	25-31	180
Geography	B.S.	40-64	48	10-34	180
German	B.A.	52	47	17-23	180
History	B.A.	52-76	48	0-22	180
Mathematics	B.A.	52-76	55	5-19	184
*Physical Education	B.S.				
Men		56	73	0-36	203
Women		69	63-69	29-36	195-196
*Physics	B.S.	37	47	0-4	184
Political Science	B.A.	52-72	48	2-22	180
Sociology	B.A.	52-76	48	0-22	180
Spanish	B.A.	52	36	28-34	180
Speech	B.A.	52-76	48	0-22	180

*Physical Education is administered by the Division of Physical Education, page 116.

*Physics is administered by the College of Engineering, page 95.

General Education Requirements outside the professional courses and the major-minor fields.

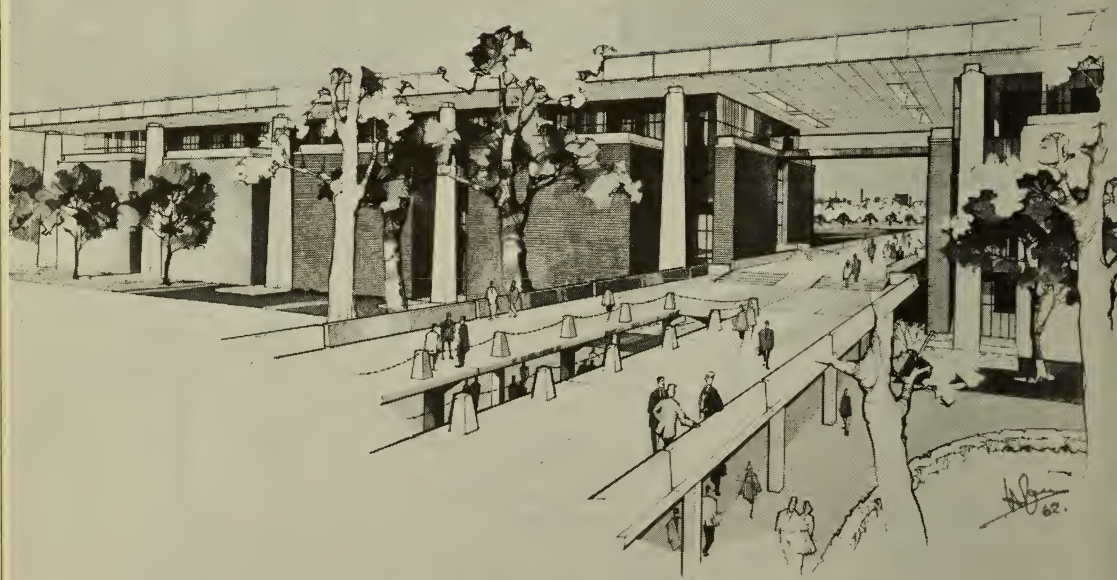
The major automatically (A) satisfies one sequence in the general education requirements.

Subject	Rhetoric	Foreign Language	Political Science	Psychology	Humanities	Social Science	Biological Science	Physical Science
Biology	X	X	X	X	X	X	A	X
Chemistry	X	X	X	X	X	X	X	A
English	X	X	X	X	A	X	X	X
French	X	X	X	X	A	X	X	X
Geography	X	X	X	X	X	A	X	X
German	X	A	X	X	A	X	X	X
History	X	X	X	X	X	A	X	X
Mathematics	X	X	X	X	X	X	X	A
Physical Education	X	X	X	X	X	X	X	X
Physics	X	X	X	X	X	X	X	A
Political Science	X	X	X	X	X	A	X	X
Sociology	X	X	X	X	X	A	X	X
Spanish	X	X	X	X	A	X	X	X
Speech	X	X	X	X	A	X	X	X

Curriculum Preparatory to Teaching in Elementary Schools

For the degree of bachelor of arts in elementary education, a minimum of 180 hours, exclusive of physical education and basic military science, distributed as follows:

<i>Language Arts</i>	24 hours
Rhetoric 101, 102	8
English ¹ or Language ²	8
Children's Literature	4
Speech	4
 1Satisfies the general education requirement in humanities.	
2An 8 hour sequence in the literature of one foreign language at the 200 level.	
<i>Science</i>	27
Biology (with laboratory)	12
Health Science	3
Physical Science (with laboratory)	12
<i>Social Science</i>	40
Geography (world regional, advanced regional)	8
American History	12
Sociology (Soc. 100 and sociology of the city)	8
Political Science (local, state, and national)	4
Psychology	8
<i>Fine Arts</i>	14
Art	6
Music	4
Creative Arts	4
<i>Mathematics</i>	12
Mathematics for the elementary teacher	12
<i>Physical Education</i>	3
Physical education activities for children	3
Required physical education	6 quarters
<i>Education</i>	31-33
Education 170, 210, 230, 250, 270	28
Education 261—Teaching of Reading	3-5
<i>Areas of Concentration</i>	12-18 hours
Mathematics—Science	51
39 hours listed above and 12 hours credit in one subject, such as mathematics or biology.	
Foreign Language	30
Advanced hours in language meet the English re- quirement. (101-102 courses excluded)	
Social Science	52
40 hours listed above and 12 hours in advanced courses in one field—psychology, sociology, economics, history, philosophy, political science, geography	
Language Arts	42
24 hours listed above and 18 advanced hours	
<i>Electives</i>	5-17



The College of Engineering

It is the purpose of the College of Engineering of the University of Illinois at Chicago Circle to educate those young people who intend to become the engineers of tomorrow. The College has committed itself to the development and presentation of programs of study that will provide unexcelled opportunities for these young people to prepare for professional and scientific careers in the broad, vital, and ever-changing field of engineering.

Engineering is a complex and dynamic profession that requires tomorrow's engineers to be educated in a manner which will enable them not only to accelerate developments in their own fields but also to comprehend and utilize the advances made in other areas of technology and science. It is the intent of the College of Engineering at Chicago Circle to develop and teach engineering curricula that implement this point of view.

The broad field of engineering may be variously delineated. First, there is the delineation according to the numerous *professional* branches of engineering, among them the larger branches covered by aeronautical engineering, chemical engineering, civil engineering, electrical engineering, industrial engineering, and mechanical engineering. In addition, there are numerous other branches, including agricultural engineering, ceramic engineering, geological engineering, marine engineering, mining engineering, petroleum engineering, sanitary engineering, and traffic engineering. Second, there is the delineation of engineering into the *nature* or *type* of work the engineer performs. This delineation includes management, administration, sales engineering, service engineering, production engineering, construction engineering, design engineering, development, analysis, applied research, pure research, and teaching.

The College of Engineering at Chicago Circle has been organized on a basis which is essentially divorced from the concepts of the *professional branches* and the *nature of work*. The College's departmental structure and its course offerings are organized on the concept of the *functional* areas of materials, energy, information, and systems, taught in the following five departments:

Department of Materials Engineering
Department of Energy Engineering
Department of Information Engineering
Department of Systems Engineering
Department of Physics

The numerous programs of study of the College are built upon the courses offered by these departments. An undergraduate in the College might well be aiming for a career as a construction engineer in some branch of civil engineering. Another may be preparing himself to be a design engineer in some area of mechanical engineering. Yet another may be setting his sights on a career in research in electrical engineering. The College, through its numerous and adaptable major fields of concentration, is able to offer programs of study compatible and commensurate with the abilities and aspirations of all these students preparing to be the engineers of tomorrow.

Major Fields of Concentration

All of the courses presented in the College of Engineering are administered by the foregoing five departments. A student majoring in engineering may decide to pursue a major field of concentration in which most of his major courses will fall within a single department. Alternatively, his elected field of concentration might well be of a nature in which his major courses overlap two or more departments. In short, it is the policy and the intention of the College of Engineering to present programs of study that are flexible, adaptable, and versatile.

Each student, after his first year of enrollment and in periodic consultation with his adviser, will select the major field of concentration which his interests and abilities indicate is appropriate.

Each student seeking a degree in engineering will follow the basic curriculum for the first four quarters. At the end of his third quarter or midway in his fourth quarter each student will be expected to decide which of the major fields of concentration he intends to pursue.

The faculty of the College of Engineering are presently engaged in preparing the following tentative list of major fields of concentration:

Structural Mechanics	Electronics
Structural Engineering	Communication Theory
Soils Engineering	Electromagnetic Theory
Architectural Engineering	Automatic Control
Mechanical Design	Circuit Analysis and Synthesis
Metallurgy and Ceramics	Computer Science
Theoretical and Applied Mechanics	Bio-Engineering
Heat Transfer and Fluid Mechanics	Systems Analysis
Thermodynamics and Gas Dynamics	Operations Research

Hydrology and Hydraulics
Transport Phenomena
Nuclear Engineering
Power Generation and Transmission

Industrial Engineering
Traffic Engineering
Urban Engineering
Engineering Physics

Common Core Curriculum

The Common Core Curriculum of the various majors is in two parts. The first covers the entire three quarters of the freshman year, the first quarter of the sophomore year, and one course (Chemistry 195) of the second quarter of the sophomore year, 66 quarter hours (excluding required physical education).

The second part of the Common Core Curriculum consists of 42 quarter hours. The precise scheduling of these hours depends on the major field of concentration the student selects.

Required Courses in the Major Field of Concentration

In order that a student may obtain knowledge in depth in the major field in which he decides to concentrate, a bloc of 36 quarter hours is allotted to the required courses in the major field of concentration. These courses are specified by the curriculum committee administering the particular major field.

Elective Courses

A bloc of 27 quarter hours is allotted to elective courses in all engineering curricula. Although these electives may be both *technical* and *nontechnical*, the student is expected to maintain a reasonable balance between them. Such courses will be selected in conference with the student's adviser.

Humanistic—Social Science Courses

An additional bloc of 27 quarter hours of courses in the humanities and the social sciences is included in all engineering curricula. Students complete a two-quarter or a three-quarter sequence of courses in a particular subject area of the humanities and the social sciences.

The total of 54 quarter hours of elective courses and humanistic—social science courses will be scheduled in periodic consultation with his adviser, in the fifth through the twelfth quarters in a sequence most beneficial to the student.

Continuing Students and Transfer Students

Continuing students and transfer students in engineering who have 12 semester hours (18 quarter hours) or more, as of the fall quarter 1965, will follow the curricula of the College of Engineering at Urbana. Students in these categories will complete their degree work in Urbana. If they are transferring to Urbana, they should be sure they meet the residence require-

ment: the last 30 *semester* hours toward the degree must be completed on the Urbana campus.

Freshmen who are beginning their college work in the fall quarter of 1965 will pursue the curriculum below. These students, on successful completion of the graduation requirements, may anticipate receiving a degree at Chicago Circle at the end of the spring quarter 1969.

Graduation Requirements

All students pursuing a program in one of the above-mentioned major fields of concentration must obtain a total of 198 quarter hours of credit, exclusive of the required physical education courses (6 quarter hours) and the elective military science courses. All of the general University requirements for graduation must also be met (see page 67).

Satisfactory completion of these requirements will lead to the degree of bachelor of science in engineering in a major in one of the fields of concentration.

Undergraduate Curriculum in Engineering

Freshman Year	Hours
<i>First Quarter</i>	
Rhetoric 101-Rhetoric and Composition	4
Mathematics 130-Analytic Geometry, Linear Algebra, and Calculus I	5
Engineering 101-Introduction to Engineering Design, I	4
Elective	4
Physical Education	1
	<hr/>
	18
 <i>Second Quarter</i>	
Rhetoric 102-Rhetoric and Composition	4
Mathematics 131-Analytic Geometry, Linear Algebra, and Calculus, II	5
Engineering 102-Introduction to Engineering Design, II	4
Physics 111-Mechanics	4
Physical Education	1
	<hr/>
	18
 <i>Third Quarter</i>	
Materials Engineering 101-Engineering Mechanics, I	3
Mathematics 132-Analytic Geometry, Linear Algebra and Calculus, III	5
Engineering 103-Introduction to Engineering Design, III	4
Physics 112-Heat and Sound	5
Physical Education	1
	<hr/>
	18

Sophomore Year

First Quarter

Materials Engineering 102-Engineering Mechanics, II	3
Mathematics 133-Analytic Geometry, Linear Algebra and Calculus, IV	5
Chemistry 194-Chemistry for Engineers, I	3
Physics 113-Electricity and Magnetism	5
Physical Education	1
	<hr/>
	17

Second Quarter

	Hours
Chemistry 195-Chemistry for Engineers, II	3
Physical Education	1
Other courses as specified (see below)	12 to 14
	<hr/>
	16 to 18

Third Quarter

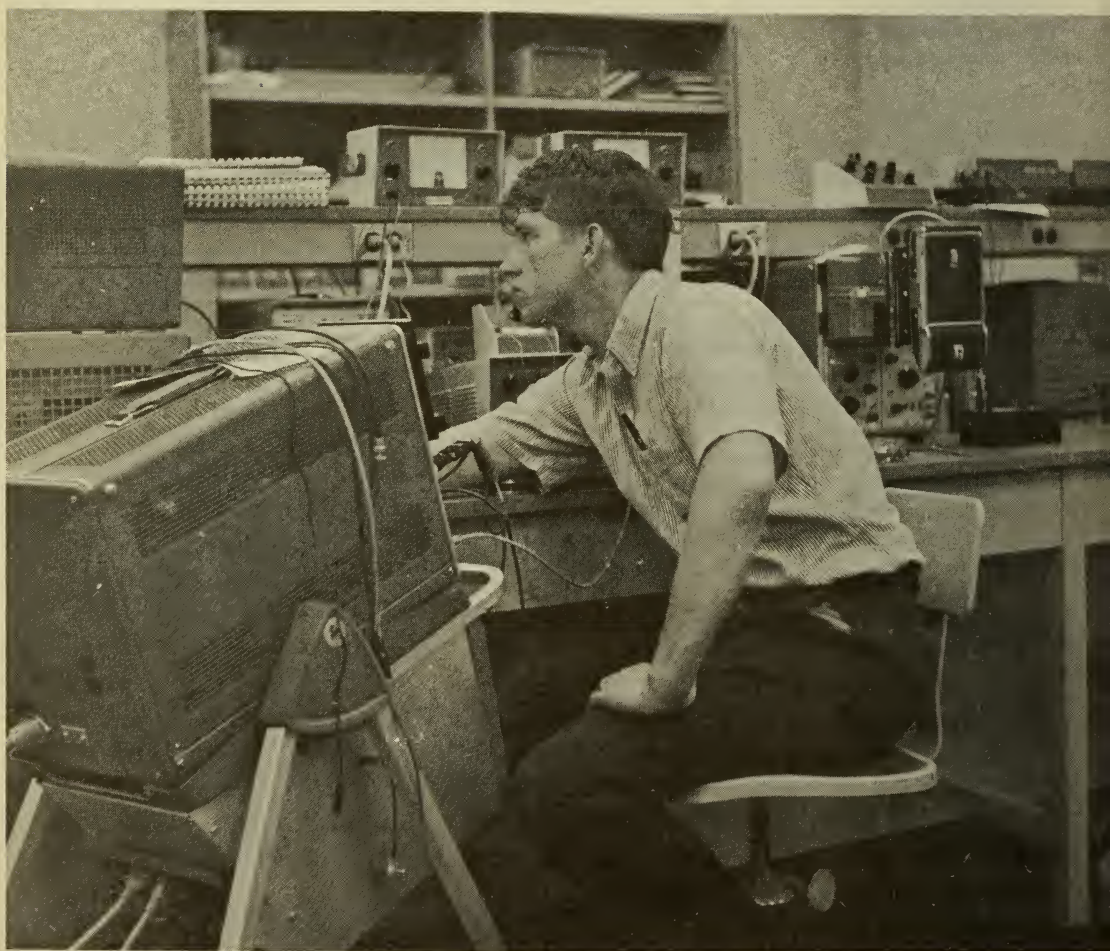
Physical Education	1
Other courses as specified (see below)	15 to 17
	<hr/>
	16 to 18

Additional Requirements

The following courses are also required in all curricula in engineering. They are to be scheduled in the specific quarters indicated by the curriculum committees administering the various major fields of concentration.

Required Courses in the Common Core Curriculum:	Hours
Mathematics 195-Introduction to Automatic Digital Computing	3
Physics 114-Light and Modern Physics	4
Materials Engineering 103-Engineering Mechanics III	3
Materials Engineering 233-Properties of Materials I	3
Materials Engineering 234-Properties of Materials II	3
Materials Engineering 236-Materials Engineering Laboratory I	1
Materials Engineering 237-Materials Engineering Laboratory II	1
Energy Engineering 211-Thermodynamics ¹	4
Energy Engineering 221-Fluid Mechanics ¹	4
Information Engineering 221-Introduction to Electromagnetic Fields ¹	4
Information Engineering 241-Electronics I ¹	4
Systems Engineering 201-Introduction to Systems Analysis I	4
Systems Engineering 202-Introduction to Systems Analysis II	4
Required Courses in the Major Field of Concentration	36
Elective Courses (including elective indicated in first quarter)	27
Humanistic-Social Science Courses (excluding Rhetoric)	27

¹The student should consult his adviser about the content of these courses, the final design of which was not complete when this Catalog went to press.



Notes

Students deficient in mathematics will take Mathematics 104 during the first quarter. This course does not carry credit toward a degree in engineering.

During the fall quarter 1965, students who have not had chemistry in high school will take Chemistry 103, for 3 quarter hours of credit, in place of the elective scheduled for the first quarter. Students who are otherwise deficient in chemistry may also be required to take Chemistry 103 during one of the quarters of the freshman year.

During the three quarters of the 1965-1966 academic year, some students will take Systems Engineering 103, Materials Engineering 111, and either an elective or Chemistry 103. These courses will substitute for the three quarter sequence in Introduction to Engineering Design.

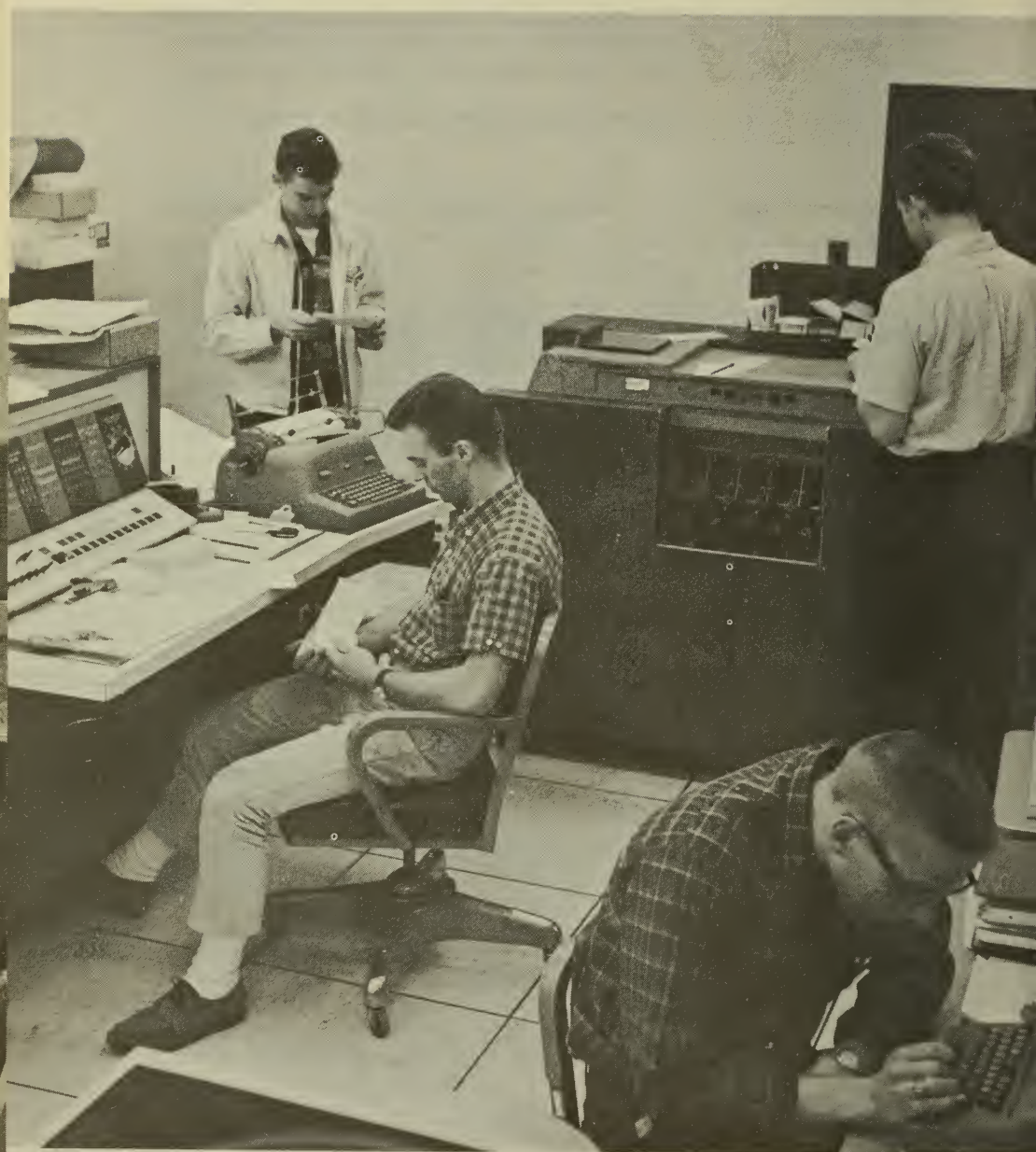
See page 119ff., "Courses of Instruction," for complete course descriptions.

The Curriculum Preparatory to Teaching Physics in Secondary Schools.

The College of Engineering also administers the curriculum that prepares students for teaching physics in secondary schools. The program, leading to a bachelor of science degree, requires 47 hours in physics, distributed as follows:

<i>Major</i>	<i>Supporting Courses—38 hours</i>
Physics 111, 112, 113, 114	Mathematics 130, 131, 132, 133
301, 302, 304, 321,	310, 321
331, 341, 371	Chemistry 112, 113, 114
Physics elective	
<i>Minor</i> (second field of specialization)—30 hours	
Physics 111, 112, 113, 114, 321	
Physics electives (8 hours)	

For additional requirements, see pages 85-86.



The College of Liberal Arts and Sciences

The College of Liberal Arts and Sciences provides a broad educational program. It is the bearer of the tradition of liberal education; hence, its students engage in the pursuit of knowledge and in the acquisition of those intellectual skills necessary to the success of that pursuit. Additionally, it is a service unit for other colleges in its offerings of fixed programs of preprofessional and professional training.

Regardless of the student's specialized interests, his program of study should be broad and varied—he should know something about the history and present circumstances of the society in which he lives. The general education program of the College, required of all Liberal Arts and Sciences students, provides this breadth and variety. See page 98.

The Departments

In addition to the broad program described above, a liberal education involves an exploration in some depth of a particular area of knowledge; hence, a student selects a major field of study and completes the requirements for a baccalaureate degree from among fifteen of the sixteen college departments: Biological Sciences, Chemistry, English, French, Geography, Geology, German (which administers Russian), History, Mathematics, Music (which does not offer the baccalaureate), Philosophy, Political Science, Psychology, Sociology and Anthropology, Spanish, and Speech and Theatre. Degrees will not be offered in anthropology, music, and Russian during the 1966-1967 academic year.

The Faculty Adviser. Although the enrollment in the college of Liberal Arts and Sciences is substantial, every effort is made to meet the individual needs of each student. The freshman and the sophomore discuss their progress with a faculty adviser; the junior and the senior receive further advisement from a member of the teaching staff of the department in which they have elected the major. This insures the student's fulfillment of all course requirements for graduation in his chosen field.

Graduation Requirements

Although each junior and senior has a faculty adviser, he is individually responsible for meeting the requirements for graduation. Therefore, each student should familiarize himself with the requirements and refer to them each time he plans a program for a quarter of work.

To be recommended for the baccalaureate, the student must meet the general University graduation requirements, listed on page 67f. In addition, he must meet these graduation requirements of the College of Liberal Arts and Sciences:

Hours Requirements

Total Hours—At least 180 hours, excluding basic military science and required physical education, are required for the degree. For certain curricula the minimum is higher.

Advanced Hours—At least 45 advanced hours are required. They must be taken, after achieving junior standing (135 hours), in 200 or 300 level courses.

Hours of Independent Study—Not more than 18 hours of credit toward the degree may be courses titled "Independent Study" or "Independent Research."

Hours in Courses Taken Outside the College—No more than 48 hours of credit may be counted toward the degree in courses taken outside the college, unless the student is majoring or minoring in physics in the General Curriculum or in the Physics Curriculum.

Foreign Language—Two years of the same language at the college level or the equivalent.

General Education—Except in the Chemistry Curriculum, page 109, the College requires 48 hours—

12 hours in biological sciences	12 hours in physical science
12 hours in humanities	12 hours in social science

One 8-hour sequence (9-hours for those Liberal Arts and Sciences students who will receive degrees in June, 1966) is permitted if it includes a course (200 or 300 level) in the upper division of the University. See page 99 for the approved general education sequences.

The Major—Each student in the General Curriculum and in curricula preparatory to teaching in the secondary schools must select a field of

specialization—his major. The majors and the hours requirements for them begin below. At least 12 hours of the major must be taken in upper division courses and while the student is in residence. For students who will receive degrees in June, 1966: 30 approved hours, at least 14 of which are taken in residence.

The Minor—In addition to a major, each student also selects a minor field of specialization, in consultation with the adviser in the department in which the major is chosen. At least 9 hours of a single minor or half of the hours in each area of a split minor must be taken in residence.

For students who will receive degrees in June, 1966: 30 approved hours in one or two departments, with at least 12 in each. At least 9 hours of a single minor or half the hours in each area of a split minor must be taken in residence.

Electives

Any course offered in the College of Liberal Arts and Sciences that is not required for the student's degree may be used as a free elective. See page 69. Electives taken outside the College must be approved by the department in which the student is fulfilling his major and by the College if they are to be counted in the total hours presented for the degree.

The General Education Sequences

The student's major automatically satisfies one sequence.

Although a department may offer more than one general education sequence, a student cannot fulfill more than one of his sequences in that department.

Biological Sciences

BioS. 100-101-102
110-111-112

Humanities

Engl. 101-102-103
121-122-123
150-151-152

Physical Sciences

Chem. 111-112-132
112-113-114
113-114-121
117-118-119
112-PSci 132

Geog. 101-102-103

Geol. 101-102-103

Hist.	131-132-133 175-176-177	Math.	115-116-117 12 hours in 110 and above
Hum.	101-102-103 106-107-108 151-152-153	PSci.	101-102-103
Fr.	201, 202, 203	<i>Social Sciences</i>	
Ger.	3 courses in literature in 200 courses or above (one may be in translation)	Geog.	104-105-106 104-105-114 104-105-123 375, 377
Span.	240-241-242 221-222-223	Hist.	115-116-117 151-152-153
Fr. 216, Ger. 216, Span. 241		PolS.	150, 151, and any other 4-hour course
Mus.	130-131-132-200	Psch.	101 or 102 and one course from 110—115 or 130 and one course from 215—230 or 240
Phil.	101-102-103 201, 203 and one additional course	<i>Soc. and Anth.</i>	
Spch.	121-122-123	Anth.	102-103-104
		Soc.	100-130-131
		Anth.	any of 102-103-104, and Soc. 100, Psch. 100
		Psch.	100 and two additional 100-level anthropol- ogy courses
		Soc.	100 and two 100-level anthropology courses
		Spch.	111-112-113

The General Curriculum

The General Curriculum of the college provides the framework within which the majority of liberal arts and sciences students complete the courses required for the degree. The requirements for the major and the minor in the General Curriculum and the requirements for the major and the minor areas of specialization for those preparing to teach in secondary schools follow.

Biological Sciences

Major: 30 hours (excluding all 100-level courses), including Biol. 340, 360, and, in the senior year, 300. Also required: one year of physics, chemistry (including organic), and one year of mathematics (calculus and/or statistics highly recommended).

Biological sciences majors are assigned a departmental adviser.

Minor: 30 hours in one or two departments of the College of Liberal Arts and Sciences or in physics, with at least 12 hours in each department if two are chosen. A course may not be counted toward both the major and the minor.

Departmental Distinction: A candidate must perform creditably in BioS. 303, Individual Topics, and must pass a comprehensive examination administered by the department to be considered for departmental distinction.

Requirements for Teaching Biology in Secondary Schools

Major—48-49 hours

BioS. 110, 111, 112
222, 250, 292
300, 315, 340
360, 324, 380
220 or 397
295 or 385

Supporting Courses—37 hours

Phys. 111, 112, 113

Chem. 112, 113, 132

Math. 115, 116, 117

Minor—30-36 hours

BioS. 110, 111, 112
222 or 292
250 or 295
315, 340, 360

Electives: 0-14 hours

Chemistry

Major: 30 hours, including Chem. 119 or 121 or equivalent, 233 and 234 or equivalent, 282 or equivalent, 380, 381, and 382 or equivalent, and two additional 300-level courses, each in a different area of chemistry.

Chemistry majors are assigned a departmental adviser.

Minor: 30 hours, chosen in consultation with the department adviser, in one or two areas.

Requirements for Teaching Chemistry in Secondary Schools

Major—54 hours

Chem. 112, 113, 114¹
121, 233, 234
335, 380, 381
382², 395

Supporting Courses—20 hours

Math. 130, 131, 132, 133

Phys. 111, 112, 113

Minor—30-36 hours

Chem. 112, 113, 114
121, 133, 134

Science electives, preferably physics, 12 hours

Electives: 0-23 hours

¹Chem. 117, 118, 119 may be substituted for 112, 113, 114 and 121 if Chemistry Department recommends.

²Chem. 340, 342, 343 may be substituted for 380, 381, 382 if Chemistry Department recommends.

English

English Literature

Major: 36 hours, distributed as follows:

Shakespeare 4 hours

Literary criticism 4 hours

History and structure of the English language 4 hours

Senior Tutorial 4 hours

American literature 4 hours

English literature before 1600 4 hours

English literature from 1660 to 1800 4 hours

English literature from 1800 to the present 4 hours

American Literature

Major: 36 hours, distributed as follows:

Engl. 255 4 hours

Engl. 256 4 hours

Engl. 257 4 hours

Shakespeare 4 hours

Senior Tutorial 4 hours

From Engl. 310, 350, 355, 386, 388 4 hours

From Engl. 288, 316, 375, 380, 389 4 hours

Courses at the 100-level may not be counted toward the major.

Minor: 32 hours, approved by the department, in one or two subjects, at least 12 hours in each subject.

The minor(s) must be selected in consultation with the student's major adviser.

Majors in either English or American literature are advised to take Engl. 150, 151, 152 (survey of English literature) during the sophomore year.

Senior Honors Seminar: Open to superior students in both majors.

Requirements for Teaching English in Secondary Schools

Major—52 hours

Rhet. 133 or 143, 246

Engl. 131, 150, 151,

152, 255, 256

247, 301, 315

335 and one 4-hour

course in the teaching

of English

Minor—30-36 hours

Rhet. 133 or 143, 246

Engl. 150, 151, 152

255, 256, 257

Electives: 0-18 hours

French

Major: 30 hours, including Fr. 201, 202, 203, 209, 210, and 211 and at least 12 hours from 300-level courses. Fr. 101, 102, 103, 104, 105, 106, 113, and 216 do not count toward the major. Majors in French are urged to complete a year in English literature and a year in European history.

Minor: 30 hours, chosen in consultation with the departmental adviser, in not more than two subjects, with at least 12 hours in each if two are chosen. Minors outside the college must also have the adviser's approval.

Departmental Distinction: Recommendation is based on a 4.5 average in all courses

counted for the major and a grade of A on the departmental comprehensive examination required of all French majors.

Requirements for Teaching French in Secondary Schools

Major—39 hours

Fr. 201, 202, 203,
209, 210, 211,
282

18 hours of 300-level courses

Note: Fr. 101, 102, 103, 104,
105, 106, 113 are
excluded from the major.

Electives: 25-31 hours

Minor—30-36 hours

Fr. 104, 105, 106,
201, 202, 203,
209, 210, 211,
282 is recommended

Geography

Major: 45 hours, at least 20 of which must be in upper-level courses, distributed as follows:

3 courses in physical geography (may be met by a physical science sequence in geology together with Geog. 102 and 103)

2 courses in regional geography, including Geog. 221

2 upper-level systematic courses, exclusive of those in physical geography

Geog. 351 or 355

Geography majors are assigned a departmental adviser.

Minor: 30 hours in two departments related to the student's special interest or objectives or in approved interdepartmental programs, with at least 12 hours in each field, and at least 4 hours in 200-level, or higher, courses.

Departmental Distinction: Consultation with departmental adviser. Enrollment in Geog. 291 and eligibility for graduation with honors in Liberal Arts and Sciences.

Requirements for Teaching Geography in Secondary Schools

Major—48 hours

Geog. 101, 102, 103,
104, 109, 114,
221 and 19 additional
hours of 200-level courses,
including at least one addi-
tional regional course

Electives: 10-34 hours

Minor—30-36 hours

Geog. 101, 102, 103,
104, 109, 221 and
10 additional hours
of 200-level courses
including one addi-
tional regional
course.

Geology

Major: 26 hours (excluding Geol. 101, 102, 103) and an acceptable course in field geology; competence in basic science covered by the following:

Mathematics—through integral calculus.

Chemistry (college)—one year

Biological Sciences—one year

Physics (college)—one year

With departmental approval, advanced work in a related subject may be substituted for 6 hours of geology.

Geology majors are assigned a departmental adviser.

Minor: 32 hours, chosen in consultation with the departmental adviser, in one or two areas related to geology. If two subjects are chosen, a minimum of 12 hours must be taken in each.

Departmental Distinction: A grade of A in Geol. 290, an acceptable thesis, and an over-all grade-point average of 4.0 or better (exclusive of military science and physical education), depending upon the level sought, are required for recommendation for departmental distinction.

German

Major: 42 hours in 200-level courses or above (exclusive of courses given in translation), including Ger. 201, 202, 203, 221, 296, 298, 300, 301, 302, and 305.

Minor: 18 hours, chosen in consultation with the departmental adviser, in courses from one other department or 24 hours from two other departments.

Honors: Students who wish to be recommended for honors must also complete Ger. 350, 351.

Requirements for Teaching German in Secondary Schools

Major—47 hours

Ger. 201, 202, 203,
221, 296, 298,
300, 301, 302,
305, 331, and
8 additional hours of
300-level courses

Minor—30-36 hours

Ger. 104, 105, 106
201, 202, 203
221 and one German
elective.

Note: Ger. 101, 102, 103,
104, 105, 106,
108, 109, 113,
114, 115, 121,
122, 123, 134, 135,
136 are excluded from
the major

Electives: 17-23 hours

History

Major: 45 hours, distributed as follows:

Freshman courses, not more than 12 hours

Junior courses, at least 9 hours in American history

at least 9 hours in Modern European history

at least 9 hours in one other field of history

Hist. 295, 296

Majors may be chosen from the following fields:

Europe since 1450 (including the Renaissance)

United States History

Ancient History

Medieval History (including the Renaissance)

British History

Russian History

History majors are assigned a departmental adviser.

Minor: 22 hours, chosen in consultation with the departmental adviser, in one subject; 30 hours in two subjects, with at least 12 hours in each.

Requirements for Teaching History in Secondary Schools

Major—48 hours

3 quarters of United States
history (introductory survey)
3 quarters of modern European
history (introductory survey)
3 quarters of 200 or 300-level
courses
3 quarters of additional 200
and 300-level courses in modern
European history (Russian,
medieval, ancient etc.)
Electives: 0-22

Minor—30-36 hours

30 hours of United States
and European history, with
at least 14 hours of courses
from the 200 or 300-course
level

Mathematics

Major: 56 hours, distributed as follows:

Math 130, 131, 132, 133

Math 310, 311, 312, 340, 341, 342

These sequences should be completed before other required courses.

18 hours from one of the following:

Pure Mathematics 220, 303, 304, 305, 307, 321, 322, 323,
332, 333, 343, 344, 350, 351, 352, 355,
356, 357, 360, 361, 362, 399

Applied Mathematics

220, 321, 322, 323, 330, 331, 370, 371,
372, 374, 375, 381, 382, 387, 388,
389, 399

Computer Science 195 (required), 220, 290, 321, 322, 330,
331, 387, 388, 389, 391, 392, 394, 395,
397, 399

Mathematics majors are assigned a departmental adviser.

Minor: 30 hours, chosen in consultation with the departmental adviser, from one or two subjects, with at least 12 hours in each if two are chosen.

Requirements for Teaching Mathematics in Secondary Schools

Major—55-57 hours

Math 130, 131, 132
133, 300, 301
302, 303, 304
305, 307, 310
340, 341, 342 or
348

Electives: 5-19 hours

Minor—30-36 hours

Math 130, 131, 132, 133
300, 307
301, 302 or
340, 303 or
348, 303

Music

Major: 56 hours, including Mus. 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 120, 121, 200, 201, 202, 203, 204, 300, 301, 302 and 151, 152, 153. Music 151 or 152 or 153 must be repeated for a total of 8 quarters. Degree candidates must also demonstrate keyboard proficiency and proficiency in basic music theory sufficient for enrollment in Mus. 101.

Minor: 18 hours, chosen in consultation with the department adviser, in one department or 24 hours in two departments.

Philosophy

Major: 42 hours, including Phil. 201, 203, 211, 330, 332. Phil. 231 (seminar) is recommended.

Majors are assigned a departmental adviser.

Minor: 22 hours in one field or 30 hours in two fields other than philosophy, chosen in consultation with the department adviser.

Departmental Distinction: Completion of Phil. 231 as a basis for a decision by the philosophy faculty.

Physics

Major: 45 hours, including Phys. 111, 112, 113, 114, 301, 302, 304, 321, 331, 341, 371.

Majors are assigned a departmental adviser.

Minor: 30 hours in one or two departments, chosen in consultation with the departmental adviser. No fewer than 12 hours may be taken in a minor department.

Requirements for Teaching Physics in Secondary Schools

This program is administered by the College of Engineering. See page 95.

Political Science

Major: 36 hours, distributed as follows:

PolS. 150, 151

4 hours in each of three of the following:

Government and Administration (in addition to 150, 151)

Political Theory

Public Law

International Affairs

A major may include 5 hours from related departments, chosen with the advance approval of the department.

Minor: 20 hours chosen in consultation with the department adviser in a single department or 24 hours in two related departments, with at least 8 hours in each.

At least half of the hours offered for the minor(s) must be in courses numbered 200 or above.

Requirements for Teaching Political Science in Secondary Schools

Major—48 hours

PolS. 150, 151

4 hours in each of the following:

Government and administration

Minor—30-36 hours

PolS. 150-151

4 hours in each of two fields of the major.

Not more than 12 hours of 100-level courses.

Political theory
Public law
International affairs
Not more than 12 hours
of 100-level political
science courses.

14 hours of political
science electives.

Note: The major may include
12 hours from a related
department.

Electives: 2-22 hours

Psychology

General Major: (for students primarily interested in general liberal education): 36 hours in the department, including Psch. 100 and 240, and at least two of the following: Psch. 110, 115, 130, 215, 220, 226. 8 hours in another social science.

Behavioral Science Major in Psychology (for students preparing to do graduate work in psychology): 30 hours, distributed as follows: Psch. 102, 243, 250, 251; at least two courses from Psch. 256, 260, 370, 380; three quarters of mathematics; Phil. 222.

All majors are assigned a departmental adviser.

Minor: 18 hours, chosen in consultation with the departmental adviser, in one other department or 24 hours in two departments.

Students preparing for graduate study should take mathematics through calculus and at least a full-year laboratory course in one other science.

Departmental Distinction: The candidate must be eligible for college honors, must satisfactorily complete the required courses in the behavioral science major, must have credit in Psch. 291, 292, and must satisfactorily complete a thesis during Psch. 293, 294.

Sociology

Major: 28 hours, including Soc. 100, distributed as follows:

One course from Soc. 185, 243, 263; Soc. 243, 263, 290, 385 and, for students preparing for graduate study, Phil. 222.

Note: A double major in sociology and anthropology is not permitted.

Minor: 18 hours in one department; 24 hours in two, with at least 8 hours in each if two are chosen.

Departmental Distinction: A candidate must have a 4.0 all-University grade-point average, must meet the general requirements for a major in sociology, and must earn 8 hours of credit in Soc. 290, to be recommended for departmental distinction.

Requirements for Teaching Sociology in Secondary Schools

Major—52-76 hours

Soc. 100, 103, 104

130, 185 and

28 additional hours,

at least 20 of which must

be in 200 and 300-level

courses in sociology

Anth. 103, 104

Electives: 0-22

Minor—30-36 hours

Soc. 100, 130, 185,

12 hours in 200-300-

level courses in

sociology

Anth. 103, 104

Spanish

Major: 30 hours (excluding Span. 101, 102, 103, 104, 105, 106, 115) distributed as follows:

Span. 221, 222, 223, 224.

12 hours of 300-level courses, including 5 hours in literature.

One year English literature or a course in European history and Span. 331 or 332.

Minor: 30 hours, chosen in consultation with the departmental adviser, in not more than two subjects, with at least 12 hours in each if two are chosen.

Requirements for Teaching Spanish in Secondary Schools

Major—49 hours*

Span. 211, 212, 213

221, 222, 280,

281, 332, 351,

352, 371 and at least

5 hours in literature

courses above the 200-level

Note: Span. 101, 102, 103,

104, 105 and 106 do

not count toward the

major

Electives: 15-21 hours*

Minor—30-36 hours

Span. 104, 105, 106

211, 212, 213

214, 215, 216

*Subject to approval by the Council on Teacher Education.

Speech and Theatre

All majors must demonstrate proficiency in public speaking and oral reading at the Spch. 101, 141 level.

Majors: 36 hours (exclusive of Speech 101 and 141)

Speech 201, 202, and one of the following options:

Communication and Public Address:

Speech 111, 112, 113; any two of 211, 212, 213; 301 or 302; one of 311, 312, 313.

Theatre and Oral Interpretation of Literature:

Speech 121, 122, 123, 151, 251, 261, 321, 322.

Television and Radio:

111, 112, 113, 231, 232, 233, 331, or 332, 333.

Minor: 18 hours in one department, chosen in consultation with the departmental adviser, or 24 hours in two departments.

Requirements for Teaching Speech in Secondary Schools

Major—48 hours

Communication and

Public Address Option:

101, 141, or proficiency*

111, 112, 113

121, 151, 201

211, 212, 213,

264, 295

Theatre and Oral Interpretation Option:

101, 141, or proficiency*

111, 112, 113

121, 122, 123

Minor—30-36 hours

101, 141, or proficiency*

111, 112, 113,

201, 211

151, 201, 211
241, 261, 264
295

*If the student demonstrates proficiency in Spch. 101 and 141 (by departmental examination), additional hours must be taken to achieve the 48-hour requirement for the major and the 30-hour minimum requirement for the minor.

The Specialized Programs

These programs consist of the program in the administration of criminal justice and the chemistry and physics curricula, both of which lead to the B.S., as distinguished from the majors in chemistry and physics within the General Curriculum.

The Administration of Criminal Justice

The degree of bachelor of arts is awarded students who fulfill the general University requirements, the college graduation requirements, and successfully complete this program in the College of Liberal Arts and Sciences.

186 hours, exclusive of physical education and basic military science, 93-94 of which are distributed as follows:

Rhet. 101, 102	8 hours
Soc. 100, 225, 276	36
251, 252, 331,	
332, 337, 393	
PolS. 150, 151, 205	12
Psch. 100, 110	8
Soc. 185 or 243 or Psch. 243	4-5
Law enforcement	12
Forensic science	12

The Chemistry Curriculum

The degree of bachelor of science in chemistry is awarded students who successfully complete this curriculum in the College of Liberal and Sciences.

192 hours, exclusive of physical education and basic military science distributed as follows:

Rhet. 101, 102	8 hours	Advanced Courses	18 hours
German or Russian	24	(chemistry, physics, mathematics, and other natural sciences courses, approved by the adviser)	
(French may be accepted; consult the department.)			
Humanities	9		
Social Sciences	9		
Chem. 117, 118, 119 ¹	52	Electives	26
233, 234, 282,		(at least 16 hours should be outside the natural sciences and mathematics)	
315, 321, 322,			
335, 340, 342			
343, 344, 345,			
additional hours	8		
300-level courses.			

¹Students not qualified to enter Chem. 117 register in 111 or 112. Those without high school chemistry who receive a grade of A in Chem. 111 may, if the departmental adviser approves, take the sequence 117, 118, 119. All others continue the 112, 113, 114, 121 sequence.

Thesis	3
Math. 130, 131, 132, 133	20
Phys. 111, 112, 113	15

Chemical Engineering

At present, a degree program in Chemical Engineering is not offered at Chicago Circle.

A student who wishes to specialize in chemical engineering follows the chemistry curriculum during his first year. The Chemistry Department Office will advise him on what portion of his subsequent studies he can complete at Chicago Circle before he transfers to Urbana or elsewhere.

The Physics Curriculum

The degree of bachelor of science in physics is awarded students who successfully complete this curriculum in the College of Liberal Arts and Sciences.

180 hours, exclusive of physical education and basic military science, distributed as follows:

Rhet. 101, 102	8 hours
Chem. 117, 118, 119	15
Foreign language (the equivalent of two years, in a single language, at the college level)	0-24
Social science	12
Humanities	12
Math. 130, 131, 132, 133	20
310, 311, 321	10
Phys. 111, 112, 113, 114	19
301, 302, 303	12
304, 371, 381	11
321, 322, 323	9
331, 361, 362	9
341, 342	6
Electives	18-42

The Preprofessional Programs

The College also offers, in varying degrees, work that prepares the student to enter the professional fields.

The first year of the curricula in forestry, home economics, and occupational therapy and the pre-journalism curriculum may be taken within the General Curriculum. A baccalaureate in a department of the College and a 3.5 average qualify the student for application to the University of Illinois law school.

The complete preprofessional program is offered in medical record administration, medical technology, dentistry, medicine, nursing, pharmacy, and veterinary medicine.

The minimum admission requirements to each of these professional programs follow.

Medical Record Administration—Minimum grade point average: 3.0.

135 hours, exclusive of physical education and basic military science, distributed as follows:

Rhet. 101, 102	8 hours
Foreign language (one) *	24
Biological sciences	12
Physical science	12
Social science	12
Humanities	12
Biol. 160, 180	10
Electives	45

*Or the equivalent of two college years in one language.

The fourth year is taken at the Medical Center.

Medical Technology—Minimum grade point average: 3.0.

135 hours, exclusive of physical education and basic military science, distributed as follows:

Rhet. 101, 102	8 hours
Foreign language (one) *	24
Social science	12
Humanities	12
Chem. 112, 113, 114	12
121, 133, 134	13
(350 and 355 are recommended)	
Phys. 101, 102, 103	15
Biol. 110, 111, 112, 250	11-24
(140, 180, 309, 340, 350, 363, 364, 391 recommended)	
Math. 105 (or placement)	3
Electives	11-25

*Or the equivalent of two college years in one language.

The fourth year is taken in the College of Medicine, which also recommends for the degree.

Predentistry—Minimum grade point average: 3.5.

Completion of the Dental Aptitude Test is required.

90 hours, exclusive of physical education, health science, and Military Science, distributed as follows:

Rhet. 101, 102	8 hours
Chem. 112, 113, 114, 121	15-17
(or 117, 118, 119)	
133, 134	8

Biol.	110, 111, 112 (recommended) or 100, 101, 102	12
Phys.	101, 102, 103	15
Electives (including one foreign language and humanities and social science)		28-30

Premedicine—Minimum grade point average: 3.5.

Students must take the College of Medicine Admission Test.

145 hours, exclusive of physical education, health science, and military science, distributed as follows:

Rhet.	101, 102	8 hours
Foreign language, one (or the equivalent of 6 quarters)		24
Biol.	110, 111, 112 (recommended) or 100, 101, 102 280, 281, 282	12 15
Chem.	112, 113, 114 121, 133, 134 or 117, 118, 119, 233, 234	25-27 10
Phys.	101, 102, 103 or 111, 112, 113, 114	15-19
Math.	105 (or equivalent)	3
Humanities		12
Social science		12
Advanced hours (courses numbered 200 or 300)		9

Prenursing—Minimum grade point average: 3.0

45 hours, exclusive of physical education, distributed as follows:

Rhet.	101, 102	8 hours
BioS.	2 quarters from 100, 101, 102	4
Chem.	111, 112, 132	12
Soc.	100	4
Psch.	100	4
Humanities		9
Electives		4

Prepharmacy—Minimum grade point average: 3.0

45 hours, exclusive of physical education, health science, and military science, distributed as follows:

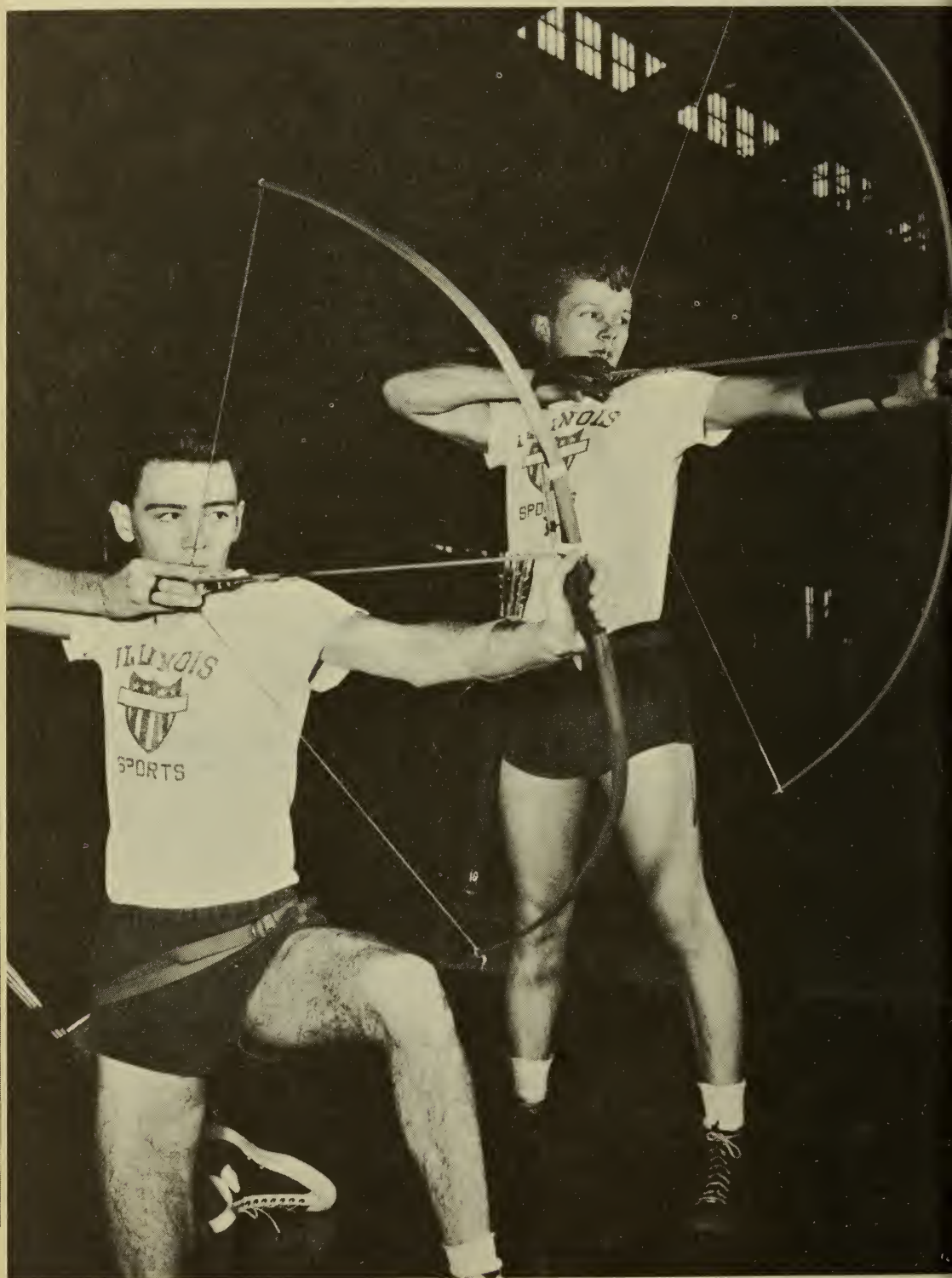
Rhet.	101, 102	8 hours
Chem.	112, 113, 114 or 117, 118, 119	12-15
Math	104, 105 or 100, 101	8-10
Electives (foreign languages, humani- ties, social science)		12-17

Preveterinary Medicine—Minimum grade point average: 3.5

90 hours, exclusive of physical education and military science, distributed as follows:

Rhet.	101, 102	8 hours
Biol.	110, 111, 112	12
Phys.	101, 102, 103	15
Chem.	112, 113, 114, 121	
	or 117, 118, 119	15-17
	133, 134	8
Foreign language (one)		12
Electives*		18-20

*Electives must include 12 hours in at least two of the following: economics, fine arts, foreign language (one) geography, history, literature, philosophy, political science, psychology, sociology, speech; 6 to 8 hours must be in the social sciences.



The Division of Physical Education

The Required Program

Men and women entering the University with less than 90 quarter hours of credit are required to secure six quarters of credit in physical education, including any amount transferred. Credit and grades for these six quarters of required physical education are not included in the total hours or the scholastic average required for graduation.

Before registration each student is given a health examination by either his own physician or the Health Service. See page 37. The results of this examination are used to prescribe each student's program. Students with handicaps are assigned activities commensurate with their physical ability. Other beginning students are assigned courses in the developmental, swimming, or combatives areas. Continuing students are given placement tests each quarter and are assigned to courses indicated by their test scores in the Physical Fitness Test (motor fitness). Every effort is made to include the student in at least one course in the following general areas: developmental activities, swimming, gymnastics, combatives, and recreational activities. Students are not generally assigned to courses in which they have a high level of fundamental skills. Practically every course in the program involves large amounts of physical activity.

All courses in the required basic instruction program meet two times a week for a total of one and one-half hours and carry 1 quarter hour of credit. See page 170 for course descriptions.

The Men's Program covers prescribed exercises, developmental activities, beginning swimming, intermediate swimming and water polo, advanced swimming and diving, life saving and skin diving, individual tumbling stunts, apparatus stunts, circus stunts, boxing, wrestling, foil fencing, personal defense activities, weight training, individual athletics, weight lifting, flickerball, touch football, softball, soccer, volleyball, basketball, speedball, archery, squash racquets, handball, tennis, badminton, bowling, golf, backyard sports, boating and fishing, and ballroom dance and American square dance.

The Women's Program offers instruction in conditioning activities, modi-

fied activities, elementary rhythms, intermediate rhythms, elementary swimming, subintermediate swimming, intermediate swimming, basketball, volleyball, softball, badminton, bowling, tennis, track and field, stunts and tumbling, and American square dance and folk dance.

Veterans have fulfilled the physical education requirement and are exempt from physical education. However, they are encouraged to utilize the physical education facilities, as are all other students in the University.

The Professional Program

The Chicago Circle Senate has approved a professional curriculum in physical education, for men and women, leading to the bachelor of science degree. Subject to approval by the University Council on Teacher Education and by the Board of Trustees, freshmen beginning in September, 1965, will register in the new curriculum.

Continuing students will follow the existing Urbana programs under the direction of an adviser.

Physical Education for Men

203 hours, including teacher education requirements, but exclusive of military science and required physical education, distributed as follows:

General education	56 hours
Professional education	28
Major	73
Support Courses (BioS 160, 180)	10
Minor	30-36
Electives	0-6

Physical Education for Women

Option I (leading to a high school certificate):

196 hours, exclusive of required physical education, distributed as follows:

General education	69 hours
Professional education	28
Major	63
Minor	30-36
Electives	0-6

Option II (leading to the special certificate for teaching grades 1-12): 195 hours, exclusive of required physical education, distributed as follows:

General education	69 hours
Professional education	28
Major	69
Electives	29

Intercollegiate and Intramural Athletics

There is a complete program of intercollegiate athletics, including cross country, soccer, football, basketball, swimming, gymnastics, wrestling, fencing, track and field, baseball, tennis, and golf. The University is a member of the Gateway Intercollegiate Athletic Conference, but this affiliation will end in June, 1966.

Over twenty activities comprise the Men's Intramural Program under the supervision of the Intramural Director.

Women's Athletic Association and Orchesis

The Women's Athletic Association and Orchesis, the modern-dance group, offer women students wide opportunities for extracurricular activities in sports and dance.



Courses of Instruction

Courses are grouped alphabetically. Within each group they are listed numerically—courses for freshmen and sophomores are numbered 100 to 199; for juniors and seniors, 200 to 399. See the appropriate Timetable for course offerings for each quarter.

Following the number and title of each course is a statement of credit given, content, and prerequisites (if any). Students with 135 or more hours of credit, regardless of the college in which they are enrolled, are classified as seniors for the purpose of designating those freshman courses that carry reduced credit for seniors.

Definition of a credit hour: A University credit hour represents one classroom hour of fifty minutes weekly for one quarter, in lecture or recitation, and either the necessary preparation time or a longer time in laboratory or other exercises for which outside preparation is not required. It is expected that most students will spend two hours preparation for one hour per week of lecture or recitation. Each University quarter-hour credit is thus understood to represent at least three hours of the student's time, and the credit value of a course is calculated in quarter hours on that basis.

ACCOUNTING

100. **Accounting, I. 3 hours.** Concepts and principles underlying the processing and reporting of accounting information for decision making. Prerequisite: Sophomore standing.
101. **Accounting, II. 3 hours.** Internal control as it affects the processing of accounting information; relationship between assets and earnings; effects of valuation methods on income determination. Prerequisite: Actg. 100.
102. **Accounting, III. 3 hours.** Managerial use of accounting information in decision making; cost control and standards for performance measurement. Prerequisite: Actg. 101.
300. **Managerial Cost Accounting. 3 hours.** Analysis of costs for control, decision making, and planning; standards and budgets as a guide to measuring operating performance. Prerequisite: Actg. 102.
301. **Asset Valuation and Income Determination. 3 hours.** The development, applications, and limitations of accounting theory as related to the valuation of assets and measurements of income. Prerequisites: Actg. 102 and consent of instructor.
302. **Accounting for Entity Interest. 3 hours.** Accounting for rights of creditors, stockholders, and partners in a going concern; effects of expansion and contraction on equities; basic principles of fiduciary and fund accounting. Prerequisites: Actg. 102 and consent of instructor.
303. **Auditing. 3 hours.** The history, function, and theory of auditing; nature of the necessary evidence for the accountant's professional opinion concerning a financial position and the results of enterprise operations; applications of statistical sampling; auditing computerized systems. Prerequisite: Actg. 302.

304. **Federal Income Tax.** 3 hours. Concepts of federal income tax; its effects on decisions of corporations, partnerships, individuals, and trusts. Prerequisites: Actg. 301, 302 or consent of instructor.
305. **Planning and Control.** 3 hours. The budget as a formal plan of action; the effect of decision making, forecasting, and uncertainty on the determination of enterprise goals; guidance techniques for the accomplishment of the planned objectives of a firm. Prerequisites: Actg. 303, 304.
306. **Readings and Advanced Problems.** 3 hours. Consolidated statements, foreign subsidiaries, insurance, estates, theory, general statements. Prerequisite: Actg. 303; senior standing.

ANTHROPOLOGY

102. **Introduction to Archaeology.** 4 hours. General survey of world archaeology; special reference to origins and development of Old World cultures.
103. **Introduction to Social Anthropology.** 4 hours. Survey of selected cultures of the world; emphasis on the concepts and methods of ethnology and social anthropology.
104. **Introduction to Physical Anthropology.** 4 hours. Human origins and development; emphasis on fossil man and races.
251. **North American Archaeology.** 4 hours. Survey; emphasis on the Illinois-Great Lakes area; the development of cultures, from the first evidence of man in North America to the coming of the Europeans. Prerequisite: Anth. 102 or consent of the instructor.
256. **Anthropology and Education.** 4 hours. An assessment of the modes of educational processes in selected cultural settings; the functioning and habituating and education agents within these cultures. Prerequisite: Anth. 103 and sophomore standing or consent of the instructor.
391. **Peoples of Africa.** 4 hours. Indigenous cultures of Africa; investigation of native African cultures as reconstructed coterminous with early historical contacts with the Western world; some additional data on present-day African cultures. Prerequisite: Anth. 103 or consent of the instructor.

ARCHITECTURE

101. **Architectural Design.** 6 hours. Theory of architectural design with elementary problems of application, emphasizing problem analysis and programming. Prerequisite: A & A 104.
102. **Architectural Design.** 6 hours. Architectural design problems with emphasis on the development and organization of space. Prerequisite: Arch. 101.
111. **Building Technology, I.** 4 hours. Wood and masonry construction and allied materials. Prerequisite: Arch. 101.
121. **Statics and Strength of Materials, I.** 3 hours. Resultants and equilibrium of force systems; conditions of equilibrium applied to trusses, frames, etc.; forces due to friction: centroids: stress and deformation in direct tension and compression; riveted and welded joints; properties of materials. Relations between external forces acting on beams and the stresses produced; shear, moment, slope, and deflection diagrams; moment of inertia; columns. Prerequisite: Math. 111, 112.

122. **Statics and Strength of Materials, II.** 3 hours. Continues Arch. 121. Prerequisite: Arch. 121.
123. **Statics and Strength of Materials, III.** 3 hours. Continues Arch. 122. Prerequisite: Arch. 122.
201. **Architectural Design.** 6 hours. Architectural design problems: structure. Prerequisite: Arch. 102.
202. **Architectural Design.** 6 hours. Architectural design problems: environmental controls. Prerequisite: Arch. 201.
203. **Architectural Design.** 6 hours. Comprehensive design problems. Prerequisite: Arch. 202.
204. **Architectural Design.** 6 hours. Comprehensive design problem (corequisite with Building Technology, VI). Prerequisite: Arch. 203.
211. **Building Technology, II.** 4 hours. Steel construction and allied materials. Prerequisite: Arch. 111.
212. **Building Technology, III.** 4 hours. Concrete construction and allied materials. Prerequisite: Arch. 211.
213. **Building Technology, IV.** 4 hours. Electricity, illumination, and acoustics. Prerequisite: Arch. 212.
214. **Building Technology, V.** 4 hours. Mechanical equipment; sanitation; heating and air conditioning. Prerequisite: Arch. 213.
215. **Building Technology, VI.** 4 hours. Comprehensive architectural problem (corequisite with Arch. 204). Prerequisite: Arch. 214.
221. **Structural Engineering, I.** 3 hours. Graphical and algebraic analysis of forces; centroids; moments of inertia; bending moments, shear and deflection in beam design; truss loadings and stresses, kerns, pressures, shear and moments in masonry structures. Analysis and design of timber trusses, riveted steel, columns, plate girders, trussed beams, structural details. Application problems from professional practice. Use of handbooks. Prerequisite: Arch. 123.
222. **Structural Engineering, II.** 3 hours. Continues Arch. 221. Prerequisite: Arch. 221.
223. **Structural Engineering, III.** 3 hours. Continues Arch. 222. Prerequisite: Arch. 222.
224. **Structural Engineering, IV.** 3 hours. Principles of reinforced concrete construction; theory of design of structural elements. General problems in the election and design of structural systems for buildings; methods of analysis; site exploration; foundations; bracing; special systems. Prerequisite: Arch. 223.
225. **Structural Engineering, V.** 3 hours. Continues Arch. 224. Prerequisite: Arch. 224.
226. **Structural Engineering, VI.** 3 hours. Continues Arch. 225. Prerequisite: Arch. 225.
231. **Ancient Architecture.** 3 hours. The development of architecture of the ancient East, Greece, and Rome. Prerequisite: A & A 144.
232. **Medieval Architecture.** 3 hours. The development of early Christian, Byzantine, Romanesque, and Gothic architecture. Prerequisite: A & A 144.
233. **Renaissance and Baroque Architecture.** 3 hours. The development of European architecture from 1400 to 1750. Prerequisite: A & A 144.
234. **American Architecture.** 3 hours. Development of architecture in colonial America and the United States, from 1620 to 1900. Prerequisite: A & A 144.
235. **European Architecture, 1750-1900.** 3 hours. Prerequisite: A & A 144.
236. **Modern Architecture.** 3 hours. The development of architecture in Europe and the United States from 1900 to present. Prerequisite: A & A 144.
237. **Japanese Architecture.** 3 hours. Religious, domestic, and landscape architecture of Japan. Prerequisite: A & A 144.

238. **Pre-Columbian Architecture.** 3 hours. Architecture of North, Central, and South America before 1500. Prerequisite: A & A 144.
241. **Urban and Regional Planning, I.** 3 hours. Man's efforts to shape the physical environment of his community. Contemporary methods of controlling urban development.
242. **Urban and Regional Planning, II.** 3 hours. Historical perspective and current problems of residential, transportation, and other functional units and systems of cities and communities. Prerequisite: Arch. 241.
301. **Architectural Design.** 6 hours. Comprehensive architectural problems. Prerequisite: Arch. 204.
302. **Architectural design.** 6 hours. Comprehensive architectural problems. Prerequisite: Arch. 301.
309. **Architectural Design Thesis.** 12 hours. Individual problem specializing in architectural design. Prerequisite: Arch. 302.
311. **Forensic Architecture.** 3 hours. Legal problems in architecture. Prerequisite: Arch. 215.
312. **Computer Analysis.** 3 hours. Computer applications to building construction and technology. Prerequisite: Arch. 215.
313. **Building Construction Systems.** 6 hours. Framing systems and components. Prerequisite: Arch. 215.
314. **Industrialized Building.** 3 hours. Prefabrication of building components. Prerequisite: Arch. 215.
315. **Logistics of Building Construction.** 3 hours. Problems dealing with the logistics of building construction. Prerequisite: Arch. 215.
316. **Environmental Control Systems.** 6 hours. Problems of color; illumination; heating and air conditioning systems. Prerequisite: Arch. 215.
319. **Building Technology Thesis.** 12 hours. Individual problems in building technology. Prerequisite: Arch. 215; 12 credits from Arch. 311-316.
321. **Foundations.** 3 hours. Elements of soil mechanics; the selection and design of pile, caisson, raft, etc. Foundations. Prerequisite: Arch. 226.
322. **Structural Seminar, I.** 3 hours. Selected topics in structural analysis and design. Prerequisite: Arch. 226 and consent of instructor.
323. **Advanced Structural Analysis.** 6 hours. Space trusses, cable roofs, matrix and computer methods of analysis. Prerequisite: Arch. 226 and consent of instructor.
324. **Structural Dynamics.** 3 hours. Vibration, wind, and earthquake analysis and design of buildings. Prerequisite: Arch. 226 and consent of instructor.
325. **Structural Seminar, II.** 3 hours. Selected topics in structural analysis and design. Prerequisite: Arch. 226 and consent of instructor.
326. **Advanced Structural Design.** 6 hours. Plastic and limit methods of design, design of prestressed concrete members and structures. Prerequisite: Arch. 226 and consent of instructor.
329. **Structural Thesis.** 12 hours. Individual problems in structures. Prerequisite: Arch. 226 and 12 credits from Arch. 321-326.
331. **Seminar.** 3 hours. Current problems in architecture. Prerequisite: 9 hours credit in the history of architecture.
332. **Reading Course.** 3 hours. Independent research in problems of the history of architecture. Prerequisite: 9 hours of credit in the history of architecture.
333. **Literature, Theory, and Criticism.** 3 hours. Selected readings and discussion of significant writers on architecture. Prerequisite: 9 hours of credit in the history of architecture.
339. **History of Architecture Thesis.** 12 hours. Individual problem in the history of architecture. Prerequisite: 21 hours of credit in the history of architecture.

343. **Professional Practice.** 3 hours. Problems related to the practice of architecture. Prerequisite: 5th year of study.

ARCHITECTURE AND ART

101. **Basic Design.** 3 hours. The basic factors in two-dimensional and three-dimensional design.
102. **Basic Design.** 3 hours. More complex systems of two-dimensional and three-dimensional design. Introduction to color theory. Prerequisite: A & A 101.
103. **Basic Design.** 3 hours. Theory and application; form and structure; three dimensional models of systems. Prerequisite: A & A 102.
104. **Basic Design.** 3 hours. Form-movement-light-time in the form of machines or sculpture. Prerequisite: A & A 103.
105. **Basic Design.** 3 hours. Kinetic development of form, space, time, and movement devices. Prerequisite: A & A 104.
106. **Basic Design.** 3 hours. Sustained project selected from any of the prior projects in wood, metal, plastic, and wet shops. Prerequisite: A & A 105.
111. **Visual Communications, I.** 2 hours. An introduction to the techniques.
112. **Visual Communications, II.** 2 hours. Continues Visual Communications, I. Prerequisite: A & A 111.
113. **Visual Communications, III.** 2 hours. Symbolic systems, image forming, and typography. Prerequisite: A & A 112.
114. **Visual Communications, IV.** 2 hours. An introduction to photographic techniques. Prerequisite: A & A 113.
115. **Visual Communications, V.** 2 hours. Photography or cinematography dealing with communication of events or visual ideas. Prerequisite: A & A 114.
116. **Visual Communications, VI.** 2 hours. Creative project based on one of the processes introduced in earlier quarters. Prerequisite: A & A 115.
141. **Man and Environment.** 3 hours. An introduction to the nature of the profession of architecture in terms of the subjective and objective factors of architectural activity.
142. **History of Architecture and the Arts, I.** 3 hours. An introduction to the methodology of art history and criticism.
143. **History of Architecture and the Arts, II.** 3 hours. A cultural-historical oriented examination of architecture and art from antiquity through medieval times. Prerequisite: A & A 142.
144. **History of Architecture and the Arts, III.** 3 hours. Continues A & A 143. A cultural-historical examination of architecture from the Renaissance to the present. Prerequisite: A & A 143.

ART

115. **Introduction to an Understanding of Art History.** 3 hours. Hypothesis of art: visual analysis; analysis of style; study of iconology; sociology and art; economics of art; psychology of art; criticism; the artist's role in history.

ART HISTORY

200. **History of Ancient Art.** 3 hours. Selected examples of painting, sculpture, and architecture; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, and other material. Prerequisite: A & A 142 or Art 115, A & A 142, 143.
201. **Medieval Art History.** 3 hours. Selected examples of painting, sculpture, and architecture; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, and other material. Prerequisite: A & A 142 or Art 115, A & A 143, 144.
202. **History of Renaissance and Baroque Art.** 3 hours. Selected examples of painting, sculpture, and architecture; the development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, and other material. Prerequisite: A & A 142 or Art 115, A & A 143, 144.
203. **Nineteenth and Twentieth Century Art History.** 3 hours. Selected examples of painting, sculpture, and architecture; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, and other material. Prerequisite: A & A 142, or Art 115, A & A 143, 144.
204. **Oriental Art History.** 3 hours. Selected examples of painting, sculpture, and architecture; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change and other material. Prerequisite: A & A 142 or Art 115, A & A 143, 144.
205. **Prehistoric Art.** 3 hours. Selected examples of painting, sculpture, and architecture; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, other material. Prerequisite: A & A 142 or Art 115, A & A 143, 144.
300. **History of American Painting and Sculpture.** 3 hours. Selected examples, development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, other material. Prerequisite: 15 hours of credit in art history.
301. **American Architecture.** 3 hours. Selected examples; development and diffusion of style and design. Pertinent analogies in the history of ideas, events, technical change, other materials. Prerequisite: 15 hours of credit in art history.
302. **Modern Painting.** 3 hours. Selected examples; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, other material. Prerequisite: AH 203.
303. **Modern Sculpture.** 3 hours. Selected examples; development and diffusion of style and iconography. Pertinent analogies in the history of ideas, events, technical change, other material. Prerequisite: AH 203.
304. **Modern Architecture.** 3 hours. Selected examples; development and diffusion of style and design. Pertinent analogies in the history of ideas, events, technical change, other material. Prerequisite: AH 203.
305. **Special Studies in Art History.** 3 hours. Individually planned reading and study programs on special problems, under staff supervision. Prerequisite: 15 hours of credit in art history.
306. **Studies in Art Criticism and Theory.** 3 hours. Selected problems. Prerequisite: 15 hours of credit in art history or senior standing.
307. **Contemporary Art.** 3 hours. Most recent developments; production and theory. Prerequisite: AH 203.

BIOLOGICAL SCIENCES

100. General Biology. 4 hours. With BioS. 101, 102, a three-quarter sequence for the nonscience major. Audio-tutorial. Principles and fundamentals of biology through examination of diverse phenomena unique to biological systems. Lecture, laboratory, and discussion. No credit for BioS. 101 unless student has credit in BioS. 101, 102.

101. General Biology. 4 hours. Continues BioS. 100.

102. General Biology. 4 hours. Continues BioS. 101.

Note: This sequence may be entered in any quarter. Students with grades of B in BioS. 100, 101, 102 may substitute this sequence for the BioS. 110, 111, 112 sequence where the latter is a prerequisite for other courses in the department.

103. Fundamentals of Biology. 4 hours. Application of biological principles to the living world. Lecture and laboratory. Prerequisite: Former Biol. 101 or 103. Not offered after fall quarter, 1965.

110. Principles of Biology. 4 hours. With BioS. 111, 112, a three-quarter sequence for the science major and the James Scholar. Problems of modern biology emphasized by examination of fundamental cellular processes and analysis of biological organization at the level of cell, organism, and population. Evolutionary and adaptive aspects of structure and function. Lecture and laboratory.

111. Principles of Biology. 4 hours. Continues BioS. 110.

112. Principles of Biology. 4 hours. Continues BioS. 111.

Note: This sequence (BioS. 110, 111, 112) is a prerequisite for most of the courses in the department.

140. Principles of Heredity. 3 hours. Introduction to genetics and the laws of inheritance with special emphasis on man and society.

145. Evolution. 3 hours. Evidence for evolution and discussion of evolutionary mechanics. Relationships of evolutionary processes to all aspects of life sciences. Museum trips.

160. Elementary Human Physiology. 5 hours. Principles of the functioning of the human body; the interrelationships of the various organs and systems. Lecture, quiz, laboratory. Prerequisite: One year of biology or consent of the instructor.

180. Introduction to Human Anatomy. 5 hours. General survey of the structure of the human body, with emphasis on the relations between form and function. Lecture, laboratory, quiz. Prerequisite: 1 year of biology or consent of the instructor.

200. History of Biology. 3 hours. Major problems and suggested solutions from the earliest records to the present. Prerequisite: 4 quarters of laboratory science.

205. Microtechnique. 4 hours. Various methods of preparing animal and plant tissue for microscopic examination. Includes techniques and basic theories related to differential staining, histo- and cyto-chemical reactions, and electron microscopy. Lecture, laboratory. Prerequisite: BioS. 112.

215. Introduction to Developmental Biology. 4 hours. Principles governing growth and differentiation at molecular, fine structural, cellular and organismic levels. Lecture, laboratory. Prerequisite: BioS. 112.

218. Introduction to Paleontology. 4 hours. Same as Geol. 218. The phylogeny, morphology, and ecology of fossils; emphasis on invertebrates. Prerequisite: One year of biology or consent of the instructor.

220. Introductory Systematic Botany. 4 hours. Classification and identification of flowering plants, with emphasis on local flora. Lecture, laboratory, occasional field trips. Prerequisite: BioS. 112.

222. **Plant Phylogeny.** 4 hours. Systematic study of representative members of all major groups of the plant kingdom; special attention to evolutionary relationships. Lecture, laboratory. Prerequisite: BioS. 102 or 112.
 230. **Structure, Development, and Evolution of Plants.** 5 hours. With BioS. 231, 232, a three-quarter sequence. Structure and function in representative types of plants in relation to their life cycles and phylogeny; the experimental approach to physico-chemical processes underlying developmental growth and differentiation. Lecture and laboratory. Prerequisite: BioS. 112.
 231. **Structure, Development, and Evolution of Plants.** 5 hours. Continues BioS. 230.
 232. **Structure, Development, and Evolution of Plants.** 5 hours. Continues BioS. 231.
 250. **General Microbiology.** 4 hours. Introduction to the principal activities and properties of microorganisms, emphasizing fundamental concepts. Lecture, laboratory. Prerequisite: BioS. 112 and credit or registration in organic chemistry.
 260. **Biology of Human Reproduction.** 3 hours. The anatomy and physiology of the human reproductive system. Prerequisite: One year of biology or BioS. 160.
 280. **Structure, Development, and Evolution of Vertebrates.** 5 hours. With BioS. 281, 282, a three-quarter sequence. Classification and evolution of vertebrates and vertebrate structures; comparative study of embryogenesis and microscopic and gross anatomy. Lecture, laboratory. Prerequisite: BioS. 112.
 281. **Structure, Development, and Evolution of Vertebrates.** 5 hours. Continues BioS. 280.
 282. **Structure, Development, and Evolution of Vertebrates.** 5 hours. Continues BioS. 281.
- Note: This sequence (BioS. 280, 281, 282) includes the subject matter of the traditionally offered separate courses in comparative vertebrate anatomy, vertebrate embryology, and vertebrate histology.
290. **Vertebrate Nervous System and Sense Organs.** 4 hours. Structure, function, and evolution of the vertebrate nervous system and sense organs with special reference to mammals. Lecture, laboratory. Prerequisite: BioS. 112 or consent of instructor.
 292. **Animal Phylogeny.** 4 hours. The classification, biological characteristics, phyletic relationships, and adaptive radiation of major animal groups. Lecture, laboratory. Prerequisite: BioS. 102 or 112.
 295. **General Entomology.** 4 hours. Introduction to the morphology, physiology, classification, behavior, and evolution of insects. Lecture, laboratory. Field work. Prerequisite: BioS. 112.
 303. **Individual Topics.** 3-5 hours. For qualified students wishing to carry out individual problems. Laboratory, conferences, and assigned readings. Prerequisite: Senior standing and approval of department.
 309. **Cytology.** 5 hours. Structure, functions, and cytochemistry of cells as revealed through modern research techniques. Lecture, laboratory. Prerequisite: BioS. 112.
 312. **Radiobiology.** 5 hours. Introduction to the fundamentals of radioisotope applications in biology, including tracer techniques, auto-radiography, instrumentation, tissue turnover rates, and health physics. Lecture, laboratory. Prerequisite: BioS. 112 and consent of the instructor.
 315. **Principles of Bioecology.** 3 hours. Composition and distribution of biotic communities, plant and animal, with emphasis on the interplay of physical and biological factors of the environment. Prerequisite: BioS. 112.

316. **Invertebrate Paleontology.** 4 hours. Same as Geol. 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisite: BioS. 218 and consent of the instructor.
318. **Vertebrate Paleontology.** 4 hours. Same as Geol. 318. Phylogeny, morphology, and ecology of the fossil vertebrates. Prerequisite: one year of biology and consent of the instructor.
319. **Paleobotany.** 4 hours. Same as Geol. 319. Prerequisite: One quarter of biology and consent of the instructor.
320. **Field Botany.** 5 hours. Flora and vegetation of the Chicago region. Lecture, laboratory, numerous field trips. Prerequisite: BioS. 112 or 222.
324. **Plant Ecology.** 2 hours. Special attention to vegetation and environment of the Chicago region. Laboratory and field trips. Prerequisite: Concurrent registration in BioS. 315.
328. **Plant Physiology, I.** 5 hours. Study of plant relations to water and solutes; translocation; inorganic plant nutrition; photosynthesis; respiration. Lecture, laboratory. Prerequisite: BioS. 360.
329. **Plant Physiology, II.** 5 hours. Intensive study of the metabolism of carbon and nitrogen compounds, and the physiology of growth and development. Lecture, laboratory. Prerequisite: BioS. 328.
338. **Phycology.** 5 hours. Morphology, physiology, bionomics, and genetics of phylogenetically representative algae, including laboratory techniques for the experimental study of these organisms. Lecture, laboratory. Prerequisite: BioS. 112.
340. **General Genetics.** 5 hours. Required for biology majors. Principles of heredity in animals, plants, and microorganisms. Lecture, laboratory. Prerequisite: BioS. 112.
342. **Cytogenetics.** 3 hours. Correlation of genetic data with variations in chromosomal structure and the role which chromosomal changes play in the evolution of populations and species. Lecture, laboratory. Prerequisite: BioS. 340.
343. **Advanced Genetics.** 5 hours. Quantitative inheritance, linkage, crossing over, genetic consequences of chromosomal aberrations; introduction to biochemical, developmental, and population genetics. Lecture, laboratory. Prerequisite: BioS. 340.
344. **Genetics of Microorganisms.** 3 hours. General principles of genetics as applied to microorganisms, including viruses, bacteria, yeast, protozoa, algae, and fungi. Prerequisite: BioS. 340.
345. **Evolutionary Theory.** 3 hours. Analysis of evolutionary mechanisms in plants and animals; variation and differentiation in populations and species; origins of supraspecific taxa. Prerequisite: BioS. 340.
350. **Advanced Microbiology.** 3 hours. Modern contributions to the cellular anatomy, physiology, and genetics of microorganisms. Prerequisite: BioS. 250 or 360 and credit or registration in biochemistry. Calculus is strongly recommended.
351. **Advanced Microbiology Laboratory.** 2 hours. Experimental consideration of the physiological processes applicable to microorganisms. Prerequisite: BioS. 350.
360. **Cellular Biodynamics.** 5 hours. Required for biology majors. The basic physiological activities common to cells; study of the functions characteristic of important specialized cell types. Lecture, laboratory. Prerequisite: BioS. 112.
363. **Animal Physiology.** 5 hours. The role of the digestive, circulatory, respiratory, and osmoexcretory systems in the maintenance of organismic homeostasis. Emphasis on vertebrates. Lecture, laboratory. Prerequisite: BioS. 360.
364. **Animal Physiology, II.** 5 hours. The role of the muscular, sensory, nervous, and endocrine systems in the maintenance of organismic integration. Emphasis on vertebrates. Lecture, laboratory. Prerequisite: BioS. 360.

370. **Comparative Animal Physiology.** 5 hours. The diverse ways by which different kinds of animals meet their functional requirements; consideration of the functional adaptations resulting from the perfection of mechanisms in response to environmental stresses in particular habitats. Lecture, laboratory. Prerequisite: BioS. 360.
375. **Biological Control Mechanisms.** 5 hours. Major physiological mechanisms involved in the direct control of homeostasis; emphasis placed on stress, fatigue, and information feedback. Lecture, laboratory. Prerequisite: BioS. 360.
380. **Animal Ecology.** 2 hours. Population and community assemblages of the Chicago region. Laboratory, field trips. Prerequisite: BioS. 112 and concurrent registration in 315.
382. **Animal Ethology.** 4 hours. Behavior of animals in their interactions with the environment through a comparative examination of selected groups. Laboratory projects, term reports. Prerequisite: BioS. 112.
383. **Vertebrate Embryology.** 5 hours. Not offered after fall quarter, 1965. The development of the vertebrate body and its organs. Lecture, laboratory. Prerequisite: Former Biol. 132.
385. **Invertebrate Zoology, I.** 5 hours. Comparative study of structure, development, classification, and evolution of the lower invertebrate groups. Prerequisite: BioS. 112.
386. **Invertebrate Zoology, II.** 5 hours. Comparative study of structure, development, classification, and evolution of the higher invertebrate groups exclusive of insects. Lecture, laboratory. Prerequisite: BioS. 385.
387. **Invertebrate Natural History.** 5 hours. Common local invertebrates, exclusive of insects, with emphasis on habitat relationships, classification, identification, and methods of collection, cultivation, and preparation. Lecture, laboratory, field work. Prerequisite: BioS. 112 or 292.
389. **Principles of Protozoology.** 5 hours. Introduction to the comparative morphology, physiology, and systematics of the protozoa, including discussion of advances in major areas of current research. Lecture, laboratory. Prerequisite: BioS. 112.
391. **Animal Parasitology.** 5 hours. Biology of animal parasites, their occurrence in nature, and their role in human welfare. Lecture, laboratory. Prerequisite: BioS. 112.
397. **Vertebrate Natural History.** 5 hours. Common local vertebrates with emphasis on habitat relationships, classification, identification, and methods of collection and preparation. Lecture, laboratory, field trips. Prerequisite: BioS. 112 or 292.

BUSINESS LAW

310. **Managerial Jurisprudence.** 4 hours. Application of the legal function to business administration. Basic legal tools for business transactions; legal aspects of the major areas of business management. Prerequisite: Junior standing in the College of Business Administration.

CHEMISTRY

103. **General Chemistry for Engineers.** 3 hours. An introductory course for students in the College of Engineering who do not qualify for Chem. 194.

111. **Introduction to Chemistry.** 3 hours. For students without entrance credit in high school chemistry or inadequately prepared for Chem. 112.
112. **Chemical Bonding and Structure.** 4 hours. Credit not given for Chem. 117 if student has credit in 112. Atomic and molecular structure, chemistry of the covalent and ionic bond. For students with one year of high school chemistry and adequate preparation, as shown by placement examination. Prerequisite: Chem. 111 or adequate performance on the placement examination.
113. **Equilibria; Chemistry of Solutions.** 4 hours. Prerequisite: Chem. 112, 117, superior performance on placement examination or advanced placement.
114. **Structure and Reactivity.** 4 hours. Prerequisite: Chem. 113 or advanced placement.
117. **General College Chemistry.** 5 hours. Primarily for students in the chemistry and chemical engineering curricula, and natural science majors. Prerequisite: Superior ability, demonstrated in placement examination.
118. **Inorganic and Analytical Chemistry, I.** 5 hours. Prerequisite: Chem. 117 with a grade of C or higher.
119. **Inorganic and Analytical Chemistry, II.** 5 hours. Prerequisite: Chem. 118.
121. **Analytical Chemistry.** 5 hours. Credit not given for Chem. 121 if student has credit in 119. Volumetric, gravimetric, and instrumental analysis. Prerequisite: Chem. 114 or advanced placement.
132. **Elementary Organic Chemistry.** 5 hours. Primarily for pre-nursing students. This course does not satisfy the organic chemistry prerequisite for biochemistry or for advanced courses in organic chemistry. Prerequisite: Chem. 112.
133. **Elementary Organic Chemistry.** 4 hours. For students not majoring in chemistry. Prerequisite: Chem. 114.
134. **Elementary Organic Chemistry.** 4 hours. Continues Chem. 133. Prerequisite: Chem. 133.
233. **Organic Chemistry.** 5 hours. For chemistry majors and students in the chemistry or chemical engineering curricula. Prerequisite: Chem. 119.
234. **Organic Chemistry.** 5 hours. Continues Chem. 233. Prerequisite: Chem. 233.
281. **Elements of Glass Blowing.** 1 hour. Demonstration and practice in glass blowing and the construction of glass laboratory equipment. Prerequisite: Junior standing and consent of instructor.
282. **Chemical Literature.** 1 hour. Prerequisite: 24 hours of chemistry; 4 quarters or equivalent of German, Russian, or French.
291. **Thesis.** 1-9 hours. Prerequisite: Senior standing for students in the chemistry
299. curriculum; others, senior standing and written departmental permission. Each student must also receive written permission from the faculty member under whom he is to work. It is recommended that a student register for at least 4 hours of thesis credit, distributed over two or more quarters. To receive credit each student must submit a written report of his project.
315. **Advanced Inorganic Chemistry.** 4 hours. Nuclear and extra-nuclear atomic structures and their relation to the properties of the elements and their compounds; survey of periodic relationships; inorganic reaction mechanisms and techniques. Prerequisite: Chem. 342 or 382.
316. **Inorganic Chemistry Laboratory.** 2 hours. Synthesis of inorganic compounds illustrating the use of modern preparative techniques. Prerequisite: Credit or registration in Chem. 315.
321. **Chemical and Instrumental Analysis, I.** 4 hours. Prerequisite: Chem. 335. Credit or registration in 343 or equivalent.
322. **Chemical and Instrumental Analysis, II.** 3 hours. Prerequisite: Chem. 321.
335. **Organic Chemistry.** 3 hours. Continues Chem. 234. Prerequisite: Chem. 234 or consent of department.

336. Organic Chemistry Laboratory. 1 hour. For students with credit or registration in Chem. 336.
337. Organic Chemistry Laboratory. 2 hours. For students with credit or registration in Chem. 335.
338. Systematic Identification of Organic Compounds. 3 hours. Prerequisite: Chem. 336, 340.
339. Theoretical Organic Chemistry. 4 hours. For students in the chemistry curriculum who wish to do further work in organic chemistry. Individual projects and readings are assigned. Prerequisite: Chem. 336 and 342.
340. Physical Chemistry, I. 3 hours. Introduction to the study of chemical principles. Prerequisite: Chem. 119 or 121; credit or registration in Math. 132 or equivalent; two quarters of physics or consent of the instructor.
342. Physical Chemistry, II. 3 hours. Prerequisite: Chem. 340.
343. Physical Chemistry Laboratory, I. 2 hours. Prerequisite: Chem. 340 and credit or registration in 342.
344. Physical Chemistry, III. 3 hours. Prerequisite: Chem. 342.
345. Physical Chemistry Laboratory, II. 1 hour. Prerequisite: Chem. 343.
346. Physical Chemistry Laboratory, II. 2 hours. Prerequisite: Chem. 343.
350. General Biochemistry. 3 hours. Chemistry of biological systems, enzymes, vitamins, nucleic acids, carbohydrates, and the like. Prerequisite: Chem. 119 or 121 and 134 or 234.
351. General Biochemistry. 3 hours. Continues Chem. 350. Prerequisite: Chem. 350.
355. Biochemistry Laboratory. 2 hours. Accompanies Chem. 350. Experimentation with biochemical systems. Prerequisite: Registration in Chem. 350.
356. Biochemistry Laboratory, II. 1 hour. Continues Chem. 355. Prerequisite: Registration in Chem. 351.
357. Biochemistry Laboratory, II. 2 hours. Continues Chem. 355. Prerequisite: Registration in Chem. 355.
380. Principles of Physical Chemistry, I. 3 hours. Primarily for students in the biological sciences. Prerequisite: Chem. 119 or 121, calculus, two quarters of physics.
381. Elementary Physical Chemistry Laboratory. 1 hour. Experimental study. Prerequisite: Registration or credit in Chem. 380.
382. Principles of Physical Chemistry, II. 3 hours. Continues Chem. 380. Prerequisite: Chem. 380 or equivalent.
395. History of Science, with Particular Reference to Chemistry. 3 hours. The historical development of leading ideas in science and chemistry. Prerequisite: 26 hours of laboratory science.

CLASSICS

100. Classical Etymology in the Life Sciences. 2 hours. The structure and formation of technical terms used in the life sciences.
101. Greek Poetry in Translation. 3 hours. Classical Greek poetry from its beginnings to the Byzantine period. A knowledge of Greek is not necessary.
111. Mythology of Greece and Rome. 3 hours. Myth and religion, folk tales, and literature.
249. Greek Tragic Drama in Translation. 4 hours. (Same as English 249.) A study of the plays of Aeschylus, Sophocles, Euripides. Plays read in English translation.

DANCE

100. **Creative Dance. 1 hour.** Beginning modern dance; creativity in the rhythmic field.

DESIGN

201. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of foundation program.
202. **Communications Design. 2 hours.** Theory and application of the elements of communications design through experiments with image, letter, form, and illustration. Prerequisite: Completion of foundation program.
203. **Communications Design. 3 hours.** Inventive exploration of applications of illustrative techniques combining word and image, collage, and imprinting. Prerequisite: Completion of foundation program.
204. **Communications Design. 4 hours.** Free and controlled manipulation of symbol, type, drawing, and photoimage from the two-dimensional plane to volume. Prerequisite: Completion of foundation program.
205. **Communications Design. 5 hours.** A comprehensive investigation of the elements and interrelations of communications design, demonstrated by research and analysis. Prerequisite: Completion of foundation program.
206. **Typographic Design. 2 hours.** Theory and application of the elements of typography. Prerequisite: Completion of foundation program.
207. **Typographic Design. 3 hours.** Visual communications projects based on the use of typographic elements and the study of basic printing methods. Prerequisite: Completion of foundation program.
208. **Typographic Design. 4 hours.** Typographic projects, utilizing various printing processes. Prerequisite: Completion of foundation program.
209. **Typographic Design. 5 hours.** Comprehensive projects involving type selection, representation, and organization preliminary to comprehensive presentation. Analysis of materials and production methods. Prerequisite: Completion of foundation program.
210. **Colloquium. 1 hour.** Continues Des. 201. Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 201.
211. **Communications Design. 2 hours.** Continues Des. 202. Theory and application of the elements of communications design through experiments with image, letter, form, and illustration. Prerequisite: Any one of Des. 211 through 218.
212. **Communications Design. 3 hours.** Continues Des. 203. Inventive exploration of applications of illustrative techniques combining word and image, collage, and imprinting. Prerequisite: Any one of Des. 211 through 218.
213. **Communications Design. 4 hours.** Continues Des. 204. Free and controlled manipulation of symbol, type, drawing, and photoimage from the two-dimensional plane to volume. Prerequisite: Any one of Des. 211 through 218.
214. **Communications Design. 5 hours.** Continues Des. 205. A comprehensive investigation of the elements and interrelations of communications design, demonstrated by research and analysis. Prerequisite: Any one of Des. 211 through 218.

215. **Typographic Design. 2 hours.** Continues Des. 206. Theory and application of the elements of typography. Prerequisite: Any one of Des. 211 through 218.
216. **Typographic Design. 3 hours.** Continues Des. 207. Visual communications projects based on the use of typographic elements and the study of basic printing methods. Prerequisite: Any one of Des. 211 through 218.
217. **Typographic Design. 4 hours.** Continues Des. 208. Typographic projects, utilizing various printing processes. Prerequisite: Any one of Des. 211 through 218.
218. **Typographic Design. 5 hours.** Continues Des. 209. Comprehensive projects involving type selection, representation, and organization preliminary to comprehensive presentation. Analysis of materials and production methods. Prerequisite: Any one of Des. 211 through 218.
219. **Colloquium. 1 hour.** Continues Des. 210. Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 210.
220. **Communications Design. 2 hours.** Continues Des. 211. Theory and application of the elements of communications design through experiments with image, letter, form, and illustration. Prerequisite: Any one of Des. 211 through 218.
221. **Communications Design. 3 hours.** Continues Des. 212. Inventive exploration of applications of illustrative techniques combining word and image, collage, and im-
printing. Prerequisite: Any one of Des. 211 through 218.
222. **Communications Design. 4 hours.** Continues Des. 213. Free and controlled ma-
nipulation of symbol, type, drawing, and photoimage from the two-dimensional
plane to volume. Prerequisite: Any one of Des. 211 through 218.
223. **Communications Design. 5 hours.** Continues Des. 214. A comprehensive investi-
gation of the elements and interrelations of communications design, demonstrated
by research and analysis. Prerequisite: Any one of Des. 211 through 218.
224. **Typographic Design. 2 hours.** Continues Des. 215. Theory and application of
the elements of typography. Prerequisite: Any one of Des. 211 through 218.
225. **Typographic Design. 3 hours.** Continues Des. 216. Visual communications proj-
ects based on the use of typographic elements and the study of basic printing meth-
ods. Prerequisite: Any one of Des. 211 through 218.
226. **Typographic Design. 4 hours.** Continues Des. 217. Typographic projects, utiliz-
ing various printing processes. Prerequisite: Any one of Des. 211 through 218.
227. **Typographic Design. 5 hours.** Continues Des. 218. Comprehensive projects in-
volving type selection, representation, and organization preliminary to comprehen-
sive presentation. Analysis of materials and production methods. Prerequisite:
Any one of Des. 211 through 218.
228. **Colloquium. 1 hour.** Current problems in design presented by professionals active
in the field. Provides a basis for planning, executing, and evaluating projects in
courses in the student's major field. Prerequisite: Des. 219.
229. **Communications Design. 2 hours.** Inventive exploration of illustrative techniques
combining word and image in communications design. Studies in application.
Prerequisite: Any one of Des. 220 through 227.
231. **Communications Design. 4 hours.** Development of a significant comprehensive
theme applicable to the problems of display, exhibition, stage, museum, exposition,
and other areas. Research, planning, and scale-model making. Prerequisite: Any
one of Des. 220 through 227.
233. **Colloquium. 1 hour.** Current problems in design presented by professionals active
in the field. Provides a basis for planning, executing, and evaluating projects in
courses in the student's major field. Prerequisite: Des. 228.
234. **Communications Design. 2 hours.** Continues Des. 229. Inventive exploration of
illustrative techniques combining word and image in communications design. Studies
in application. Prerequisite: Any one of Des. 229, 230, 231, 232.

235. **Communications Design. 3 hours.** An intensive project: Long-range planning, development, coordination. Analysis and research; presentation technique. Prerequisite: Any one of Des. 229, 231, 330, 332.
238. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 233.
239. **Communications Design. 2 hours.** Continues Des. 234. Inventive exploration of illustrative techniques combining word and image in communications design. Studies in application. Prerequisite: Any one of Des. 234, 235, 336, 337.
240. **Communications Design. 3 hours.** Continues Des. 235. An intensive project: Long-range planning, development, coordination; analysis and research; presentation technique. Prerequisite: Any one of Des. 234, 235, 336, 337.
243. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of foundation program.
244. **Photography—Film. 2 hours.** Basic principles of photography or cinematography with introduction to camera, light meter, and printing techniques. Prerequisite: Completion of foundation program.
245. **Photography—Film. 3 hours.** The camera as a means of recording. Interpreting complex volumes and situations. Projection by enlarging. Incorporation of other materials on photosensitive surfaces. Prerequisite: Completion of foundation program.
246. **Photography—Film. 4 hours.** Light design problems where objects and images are interrelated through darkroom techniques. Studies of multiple exposure, distortion, and color. Prerequisite: Completion of foundation program.
247. **Photography—Film. 5 hours.** Photography or cinematography. A comprehensive experimental use of light as a creative and expressive medium, exploration of single and multiple projection through slides or motion pictures on flat, volumetric, or spatial surfaces, static or in motion. Prerequisite: Completion of foundation program.
248. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 243.
249. **Photography—Film. 2 hours.** Continues Des. 244. Basic principles of photography or cinematography with introduction to camera, light meter, and printing techniques. Prerequisite: Any one of Des. 244, 245, 246, 247.
250. **Photography—Film. 3 hours.** Continues Des. 245. The camera as a means of recording. Interpreting complex volumes and situations. Projection by enlarging. Incorporation of other materials on photosensitive surfaces. Prerequisite: Any one of Des. 244, 245, 246, 247.
251. **Photography—Film. 4 hours.** Continues Des. 246. Light design problems where objects and images are interrelated through darkroom techniques. Studies of multiple exposure, distortion, and color. Prerequisite: Any one of Des. 244, 245, 246, 247.
252. **Photography—Film. 5 hours.** Continues Des. 247. Photography or cinematography. A comprehensive experimental use of light as a creative and expressive medium, exploration of single and multiple projection through slides or motion pictures on flat, volumetric, or spatial surfaces, static or in motion. Prerequisite: Any one of Des. 244, 245, 246, 247.
253. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 248.

254. **Photography—Film. 2 hours.** Continues Des. 249. Basic principles of photography or cinematography with introduction to camera, light meter, and printing techniques. Prerequisite: Any one of Des. 249, 250, 251, 252.
255. **Photography—Film. 3 hours.** Continues Des. 250. The camera as a means of recording. Interpreting complex volumes and situations. Projection by enlarging. Incorporation of other materials on photosensitive surfaces. Prerequisite: *Any one of Des. 249, 250, 251, 252.
256. **Photography—Film. 4 hours.** Continues Des. 251. Light design problems where objects and images are interrelated through darkroom techniques. Studies of multiple exposure, distortion, and color. Prerequisite: Any one of Des. 249, 250, 251, 252.
257. **Photography—Film. 5 hours.** Continues Des. 252. Photography or cinematography. A comprehensive experimental use of light as a creative and expressive medium, exploration of single and multiple projection through slides or motion pictures on flat, volumetric, or spatial surfaces, static or in motion. Prerequisite: Any one of Des. 249, 250, 251, 252.
258. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 253.
259. **Photography—Film. 2 hours.** An introduction to photography or cinematography with experiments in various film-making and recording techniques. Prerequisite: Any one of Des. 254, 255, 256, 257.
263. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 258.
264. **Photography—Film. 2 hours.** Continues Des. 259. An introduction to photography or cinematography with experiments in various film-making and recording techniques. Prerequisite: Any one of Des. 259, 360, 361, 362.
265. **Photography—Film. 3 hours.** Experimentation directed toward preparation for projects in photography or cinematography, audiovisual aids, television, and theater. Prerequisite: Any one of Des. 259, 360, 361, 362.
268. **Colloquium. 1 hour.** Continues Des. 263. Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 263.
269. **Photography—Film. 2 hours.** Continues Des. 264. An introduction to photography or cinematography with experiments in various film-making and recording techniques. Prerequisite: Any one of Des. 264, 265, 366, 367.
270. **Photography—Film. 3 hours.** Continues Des. 265. Experimentation directed toward preparation for projects in photography or cinematography, audiovisual aids, television, and theater. Prerequisite: Any one of Des. 264, 265, 366, 367.
271. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of foundation program.
272. **Industrial Design. 2 hours.** An experimental approach to the utilization of functional structures, i.e., for support and suspension in tension and compression. Application of the foregoing principles to functional design. Prerequisite: Completion of foundation program.
273. **Industrial Design. 3 hours.** Studies of two-dimensional and three-dimensional presentations; sequential analysis; photo recording; charts; diagrams; drawings; other visual materials. Prerequisite: Completion of foundation program.
274. **Industrial Design. 4 hours.** Systematic two-dimensional and three-dimensional investigation of communication elements as they relate to design and planning for

- display and exhibition design. Prerequisite: Completion of foundation program.
275. **Industrial Design. 5 hours.** Analysis and planning preliminary to comprehensive projects involving the development of solutions to problems of production, logistics, and the like. Prerequisite: Completion of foundation program.
 276. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 271.
 277. **Industrial Design. 2 hours.** Continues Des. 272. An experimental approach to the utilization of functional structures, i.e., for support and suspension in tension and compression. Application of above principles to functional design. Prerequisite: Any one of Des. 272, 273, 274, 275.
 278. **Industrial Design. 3 hours.** Continues Des. 273. Prototyping; production processes; material investigation. Prerequisite: Any one of Des. 272, 273, 274, 275.
 279. **Industrial Design. 4 hours.** Continues Des. 274. Systematic two-dimensional and three-dimensional investigation of communication elements as they relate to design and planning for display and exhibition design. Prerequisite: Any one of Des. 272, 273, 274, 275.
 280. **Industrial Design. 5 hours.** Continues Des. 275. Analysis and planning preliminary to comprehensive projects involving the development of solutions to problems of production, logistics, and the like. Prerequisite: Any one of Des. 272, 273, 274, 275.
 281. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 276.
 282. **Industrial Design. 2 hours.** Continues Des. 277. An experimental approach to the utilization of functional structures, i.e., for support and suspension in tension and compression. Application of above principles to functional design. Prerequisite: Any one of Des. 277, 278, 279, 280.
 283. **Industrial Design. 3 hours.** Continues Des. 278. Prototyping; production processes; material investigation. Prerequisite: Any one of Des. 277, 278, 279, 280.
 284. **Industrial Design. 4 hours.** Continues Des. 279. Systematic two-dimensional and three-dimensional investigation of communication elements as they relate to design and planning for display and exhibition design. Prerequisite: Any one of Des. 277, 278, 279, 280.
 285. **Industrial Design. 5 hours.** Continues Des. 280. Analysis and planning preliminary to comprehensive projects involving the development of solutions to problems of production, logistics, and the like. Prerequisite: Any one of Des. 277, 278, 279, 280.
 286. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 281.
 287. **Industrial Design. 2 hours.** Advanced design in two-dimensional and three-dimensional presentations, sequential analysis, photo records, charts, diagrams, drawings, and other visual materials. Prerequisite: Any one of Des. 282, 283, 284, 285.
 290. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 295.
 291. **Industrial Design. 2 hours.** Continues Des. 287. Advanced design in two-dimensional and three-dimensional presentation, sequential analysis, photo records, charts, diagrams, drawings, and other visual materials. Prerequisite: Des. 287.
 292. **Industrial Design. 3 hours.** Projects developed from forming concepts. Natural and synthetic materials—heat, chemical, and mechanical processes. Prototyping techniques and material investigation. Prerequisite: Des. 287.

295. **Colloquium. 1 hour.** Current problems in design presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Des. 290.
296. **Industrial Design. 2 hours.** Continues Des. 291. Advanced design in two-dimensional and three-dimensional presentation, sequential analysis, photo records, charts, diagrams, drawings, and other visual materials. Prerequisite: Des. 291 or 292.
297. **Industrial Design. 3 hours.** Continues Des. 292. Projects developed from forming concepts. Natural and synthetic materials—heat, chemical, and mechanical processes. Prototyping techniques and material investigation. Prerequisite: Des. 291 or 292.
330. **Synthesis of the Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of Des. 220 through 227.
332. **Communications Design. 5 hours.** A comprehensive project in an area of social significance, using several mass media. Research, analysis, development, design, coordination, and presentation. Prerequisite: Any one of Des. 220 through 227.
336. **Communications Design. 4 hours.** Continues Des. 231. A significant comprehensive theme applicable to the problems of display, exhibition, stage, museum, exposition, and other areas. Research, planning, and scale-model making. Prerequisite: Any one of Des. 229, 231, 330, 332.
337. **Communications Design. 5 hours.** Continues Des. 332. A comprehensive project in an area of social significance, using several mass media. Research, analysis, development, design, coordination, and presentation. Prerequisite: Any one of Des. 229, 231, 330, 332.
341. **Communications Design. 4 hours.** Continues Des. 336. A significant comprehensive theme applicable to the problems of display, exhibition, stage, museum, exposition, and other areas. Research, planning, and scale-model making. Prerequisite: Any one of Des. 234, 235, 336, 337.
342. **Communications Design. 5 hours.** Continues Des. 337. A comprehensive project in an area of social significance, using several mass media. Research, analysis, development, design, coordination, and presentation. Prerequisite: Any one of Des. 234, 235, 336, 337.
360. **Synthesis of the Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of Des. 254 through 257.
361. **Photography—Film. 4 hours.** Elements of photographic communication with lights and multiple projection, using slides, film strips, gelatins, filters, words, and images. Prerequisite: Any one of Des. 254, 255, 256, 257.
362. **Photography—Film. 5 hours.** A significant project in photographic or cinematographic communication involving photo animation, photo journalism, portraiture, editorial, industrial, or architectural photography. Prerequisite: Any one of Des. 254, 255, 256, 257.
366. **Photography—Film. 4 hours.** Continues Des. 361. Elements of photographic communication with lights and multiple projection, using slides, film strips, gelatins, filters, words, and images. Prerequisite: Any one of Des. 259, 360, 361, 362.
367. **Photography—Film. 5 hours.** Continues Des. 362. A significant project in photographic or cinematographic communication, involving photo animation, photo journalism, portraiture, editorial, industrial, or architectural photography. Prerequisite: Any one of Des. 259, 360, 361, 362.
371. **Photography—Film. 4 hours.** Continues Des. 366. Elements of photographic communication, with lights and multiple projection, using slides, film strips, gelatins, filters, words, and images. Prerequisite: Any one of Des. 264, 265, 366, 367.

- 372. Photography—Film. 5 hours.** Continues Des. 367. A significant project in photographic or cinemagraphic communication involving photo animation, photo journalism, portraiture, editorial, industrial, or architectural photography. Prerequisite: Any one of Des. 264, 265, 366, 367.
- 388. Synthesis of the Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of Des. 282, 283, 284, 285.
- 389. Industrial Design. 4 hours.** Comprehensive development of systems for mass forming of materials for general and specific goals; economics of production and distribution. Prerequisite: Any one of Des. 282, 283, 284, 285.
- 390. Industrial Design. 5 hours.** An advanced comprehensive design, research, and development project involving areas of human environmental requirements. Research, analysis, planning, prototypes, testing, and total presentation. Prerequisite: Any one of Des. 282, 283, 284, 285.
- 393. Industrial Design. 4 hours.** Continues Des. 389. Comprehensive development of systems for mass forming of materials for general and specific goals; economics of production and distribution. Prerequisite: Any one of Des. 287, 388, 389, 390.
- 394. Industrial Design. 5 hours.** Continues Des. 390. An advanced comprehensive design, research, and development project involving areas of human environmental requirements. Research, analysis, planning, prototypes, testing, and total presentation. Prerequisite: Any one of Des. 287, 388, 389, 390.
- 398. Industrial Design. 4 hours.** Continues Des. 393. Comprehensive development of systems for mass forming of materials for general and specific goals; economics of production and distribution. Prerequisite: Any one of Des. 291, 292, 393, 394.
- 399. Industrial Design. 5 hours.** Continues Des. 394. An advanced comprehensive design, research, and development project involving areas of human environmental requirements. Research, analysis, planning, prototypes, testing, and total presentation. Prerequisite: Any one of Des. 291, 292, 393, 394.

ECONOMICS

- 120. Principles of Economics, I. 4 hours.** The elements of economic analysis: concepts of economy, market organization, price determination and function. Prerequisite: Sophomore standing.
- 121. Principles of Economics, II. 4 hours.** The elements of economic analysis, continued: determination of the level of economic activity; the effect of monetary and fiscal policies on economic activity levels. Applied economic policy problems. Prerequisite: Econ. 120.
- 320. Macro-Economic Theory. 3 hours.** Principles of national income accounting, determination of aggregate income and employment of the monetary system in relation to income and employment, short-term income fluctuations, long-term income growth. Prerequisite: Econ. 121.
- 321. Micro-Economic Theory. 3 hours.** The operation of individual markets; market structure; the theory of the firm; the theory of production; demand theory. Prerequisite: Econ. 121.
- 322. Managerial Economics. 3 hours.** The application of economic theory to decision making in the business firm; demand and cost analysis (including demand forecasts); price policy of the individual firm; capital budgeting; production analysis; uses of operations research methods. Prerequisite: Econ. 321.
- 323. Business Conditions Analysis. 3 hours.** The application of economics theory to analysis of changes in aggregate income and employment; methods of forecasting

changes. Examination of economic models and other analytical tools; their uses in the prediction of aggregate and more refined levels of business activity. Prerequisite: Econ. 320.

324. **Economic History of the United States.** 3 hours. The evolution of the economic institutions of the United States from colonial times to the present; the Westward Movement, industrial growth, agriculture, commerce, finance, transportation, trust movement, labor, urban growth. Prerequisite: Econ. 121.
325. **Economic History of Europe.** 3 hours. Evolution of the economic institutions of modern Europe, beginning with the origins of modern capitalism in relation to the development of industry, commerce, transportation, finance, and labor. Prerequisite: Econ. 121.
326. **History of Economic Thought.** 3 hours. The major schools of economic thought; analysis of the historical evolution of the leading ideas of modern economics. Prerequisite: Econ. 121.
327. **Comparative Economic Systems.** 3 hours. The normative and positive characteristics of capitalism, fascism, democratic socialism, and communism. Prerequisite: Econ. 121.
328. **Government Finance.** 3 hours. Government finance at the federal, state, and local levels; government expenditures; principles of taxation; fiscal policy; government borrowing and the national debt; intergovernmental fiscal relations. Prerequisite: Econ. 121.
329. **Industrial Organization.** 3 hours. The structure of markets, behavior of firms within the market environment, measures of industrial concentration; economics of scale; mergers and the merger movement; price discrimination and tie-in sales; monopoly and cartel arrangements; resale price maintenance; innovation and technological change. Prerequisite: Econ. 121.
330. **Government and Business.** 3 hours. The rationale and the mechanisms of the social control of business; the effects of government action in influencing the behavior of business firms; the procompetitive policy embodied in the Sherman Act and related legislation; industries in which direct control supplements market forces. Prerequisite: Econ. 121.
331. **Labor Economics.** 3 hours. Economic problems and issues of trade union organization and wage theory; job security, hours, working conditions, labor legislation, unemployment. Prerequisite: Econ. 121.
332. **Urban Economics.** 3 hours. Economic problems of cities: The nature and function of cities; the demand for, and supply of housing and urban land; implications of local theory for the spatial pattern of cities; the impact of government programs. Prerequisite: Econ. 121.
333. **International Economics.** 3 hours. The balance of payments; fixed, flexible, and multiple exchange rates; the forward exchange market; the international trade multiplier; the transfer problem and capital flows; the law of comparative advantage; the gains from trade; tariffs and subsidies, the factor price equalization theorem; international economic communities. Prerequisite: Econ. 121.
334. **Economic Development.** 3 hours. Balanced versus unbalanced economic growth; shadow pricing; problems of capital formation; investment criteria; trade aspects of growth; monetary and fiscal problems of development; framing a developmental plan; input-output analysis and other programming techniques. Prerequisite: Econ. 121.

EDUCATION

- 170. Educational Foundations. 4 hours.** The philosophical, historical, and social forces influencing current issues and practices in American education; their relevance in understanding the role of the teacher. Prerequisite: Psch. 100; 60 hours of work.
- 201. Foundations of American Education. 3 hours.** Not offered after fall quarter, 1965. Open only to students in an approved teacher education curriculum. Social issues affecting the American school; relationships between the school and the community; the democratic ethic as a frame of reference for American teachers. Prerequisite: Ed. 101, Psch. 100.
- 210. The Educative Process. 4 hours.** An interdisciplinary study of the biosocial and psychological factors influencing learning processes; the application of behavioral sciences knowledge to understanding the individual learner in the educative process. Prerequisite: Ed. 170 or equivalent.
- 230. Curriculum and Instruction in the Secondary School. 4 hours.** Basic principles of curriculum development, organization of learning experiences, the basic concepts of teaching. The application of the principles prepares the student for responsibilities in curriculum planning and classroom instruction in his fields of specialization. Prerequisite: Ed. 210 or equivalent.
- 250. Educational Evaluation. 4 hours.** Theories and methods of evaluation: the assessment of individuals, groups, and educational institutions in the attainment of educational objectives. Prerequisite: Ed. 230.
- 270. Educational Practice with Seminar. 12 hours.** The professional quarter of practice teaching; including a weekly seminar, to meet certification requirements for teaching in the secondary school. Prerequisite: Ed. 250.

ENERGY ENGINEERING

- 202. Thermodynamics and Heat Transfer. 5 hours.** Heat and work transfers and their effects on properties of simple working media undergoing nonflow and steady-flow processes, heat transfer by conduction, convection, and radiation. Prerequisite: Math. 221 and 321, Phys. 113, MatE. 113.
- 205. Thermodynamics. 5 hours.** Energy and its transformation; properties of thermodynamic systems, nonflow and steady-flow processes of fluids; reversibility and limitations; behavior of gases, liquids, and vapors; entropy and the second law; thermodynamics temperature scales and heat engines. Prerequisite: Math. 132, Phys. 113.
- 232. Fluid Mechanics. 5 hours.** Analysis of flow of fluids in pipes and in open channels. Bernoulli theorem; viscosity; laminar and turbulent flow; effects of jets on vanes; hydraulic similitude; dimensional analysis; Reynolds and Froude numbers. Prerequisite: MatE. 113.
- 250. Hydrology. 5 hours.** Principles, methods of analysis, and applications for engineering planning and design. The various phases of the hydrologic cycle, data collection and interpretation, water resources systems, determination of flow capacity for hydraulic structures, use of electronic computers and statistical analysis. Prerequisite: EnrE. 232, Math. 250.

ENGINEERING

101. **Introduction to Engineering Design, I.** 4 hours. Orientation, history of engineering, engineering graphics, statics of particles, design problems.
102. **Introduction to Engineering Design, II.** 4 hours. Descriptive geometry and vectors, statics of rigid bodies, introduction to statistics, discrete and combinatorial probability, design problems. Prerequisite: Engr. 101.
103. **Introduction to Engineering Design, III.** 4 hours. Continues Engr. 101, 102. The design process; energy, information, systems, materials, physics defined. Human factors, optimization techniques, design project. Prerequisite: Engr. 102.

ENGLISH

101. **Introduction to Poetry.** 4 hours; seniors, 3 hours. Understanding poetry by reading and discussing representative poems.
102. **Introduction to Drama.** 4 hours; seniors, 3 hours. Understanding drama by reading and discussing representative plays. Selections from Greek, Elizabethan, modern English, Continental, and American drama.
103. **Introduction to Fiction.** 4 hours; seniors, 3 hours. Understanding fiction by reading and discussing representative American, British, and Continental fiction of several periods and types.
113. **American Literature, I.** 4 hours. Classic American authors before the Civil War; an introduction to Franklin, Poe, Emerson, Hawthorne, Melville, Whitman, and others. Prerequisite: Sophomore standing or exemption from Rhet. 102.
114. **American Literature, II.** 4 hours. Classic American authors after the Civil War to the present; an introduction to Mark Twain, James, Dreiser, Hemingway, O'Neill, Frost, and others. Prerequisite: Sophomore standing or exemption from Rhet. 102.
121. **Chief English Writers Before 1800.** 4 hours. Chaucer, Shakespeare, Donne, Pope, and others. Prerequisite: Sophomore standing or exemption from Rhet. 102 or designation as James Scholar.
122. **Chief English Writers of the Nineteenth Century.** 4 hours. Coleridge, Tennyson, Arnold, and other writers. Prerequisite: Sophomore standing or exemption from Rhet. 102 or designation as James Scholar.
123. **Chief Modern English Writers.** 4 hours. Conrad, Eliot, Joyce, Lawrence, Shaw, Yeats, and others. Prerequisite: Sophomore standing or exemption from Rhet. 102 or designation as James Scholar.
131. **Introduction to Shakespeare.** 4 hours. Survey of Shakespeare's plays and poems. Prerequisite: Sophomore standing or exemption from Rhet. 102.
150. **A Survey of English Literature, I.** 4 hours. No credit for Engl. 150 if student has credit in 121. A chronological survey of the major works of English literature from the Old English period to 1760. With Engl. 151 and 152, recommended for all English majors.
151. **A Survey of English Literature, II.** 4 hours. No credit for Engl. 151 if student has credit in 122. A chronological survey of the major works of English literature from 1760 to 1900.
152. **A Survey of English Literature, III.** 4 hours. No credit for Engl. 152 if student has credit in 123. A chronological survey of the major works of English literature from 1900 to the present.
225. **English Literature of the Early Renaissance.** 4 hours. Sidney, Marlowe, Johnson, Spenser, and others.

226. **English Literature of the Late Renaissance and Interregnum.** 4 hours. Donne, Herrick, Bacon, Burton, Marvell, Hall, Herbert, Milton, and others.
231. **Shakespeare.** 4 hours. The young playwright's uses of older and current modes of drama, from Roman comedy and the history play through revenge tragedy.
232. **Shakespeare.** 4 hours. The mature playwright's handling of great tragic themes and his uses of tragicomedy.
243. **English Prose and Poetry of the Romantic Movement, I.** 4 hours. Introductory study of the pre-Romantics, with an emphasis upon Blake and Burns, followed by a close study of the early Romantics, with an emphasis upon Wordsworth and Coleridge.
244. **English Prose and Poetry of the Romantic Movement, II.** 4 hours. Poetry and fiction of Scott; poetry, criticism, and letters of Byron, Shelley, and Keats; prose of Landor, Hazlitt, Hunt, and DeQuincey.
247. **English Literature from 1660 to 1730.** 4 hours. Major works of the later decades of the seventeenth century and early decades of the eighteenth: Restoration drama, Swift, Pope, Addison, Milton, Steel, Fielding, and others.
248. **English Literature from 1730 to 1798.** 4 hours. The major authors of the middle and late eighteenth century and the intellectual and historical background; the novelists, the Johnson circle, and the pre-Romantics.
249. **Greek Tragic Drama in Translation.** 4 hours. (Same as Classics 249.) Plays of Aeschylus, Sophocles, Euripides. Plays read in English translation.
254. **The Bible as Literature.** 4 hours. Literary materials, origins, forms, and interpretations of principal portions of the Old and the New Testament in English translation.
255. **Survey of American Literature from 1607 to the Civil War.** 4 hours. No credit for Engl. 255 if student has credit in 113. American literature and its cultural background from the beginnings through Poe.
256. **Survey of American Literature, II.** 4 hours. No credit for Engl. 256 if student has credit in 114. American literature and its cultural background from the Transcendentalists to 1912.
257. **Survey of American Literature, III.** 4 hours. Major figures in American literature from 1912 to the present.
259. **The Victorian Novel.** 4 hours. A critical study of selected novels of the Victorian era, including works by Dickens, Thackeray, Trollope, George Eliot, Meredith, Hardy, and others.
263. **Early Victorian Literature.** 4 hours. The major figures of the Victorian period to 1859; Tennyson, Browning, Arnold, Carlyle, J. S. Mill, Macaulay, Dickens, Thackeray, and others.
264. **Victorian Literature from 1859 to 1901.** 4 hours. Major figures: FitzGerald, Darwin, Huxley, Newman, Arnold, Ruskin, Swinburne, the Rossettis, Meredith, Stevenson, George Eliot, Hardy, and others.
272. **Business Communications.** 3 hours. Theory of and practice in the written informative communications—reports and memorandums—required in business and government. Organization, condensation, and adaptation to various audiences; use of graphic devices. For the student whose career will require competence in writing reports and memorandums. Prerequisite: Rhet. 101, 102, and 151 or consent of the head of the department. Open to students in all colleges.
281. **Modern Drama, I.** 4 hours. The major playwrights and the trends in drama from 1870 to about 1920; particular attention to Ibsen, Strindberg, Shaw, Chekhov.
282. **Modern Drama, II.** 4 hours. Major trends and dramatists from the 1920's to the present, including Pirandello, Brecht, O'Neill, Lorca, O'Casey, Giraudoux, Beckett, and others.

283. **English Literature in the Twentieth Century, I.** 4 hours. English literature from the 1890's to about 1930.
284. **English Literature in the Twentieth Century, II.** 4 hours. English literature from about 1930 to the present.
288. **The Twentieth Century American Novel.** 4 hours. Historical and critical study of the development of the American novel from Dreiser to the present. Close reading of several representative novels.
289. **Development of Modern Poetry.** 4 hours. Hardy, Yeats, Auden, Dylan Thomas, Frost, Stevens, Eliot, Cummings, and others. Prerequisite: Eight hours of English literature or consent of the instructor.
290. **Development of Modern Fiction.** 4 hours. The techniques and themes of modern fiction in the West from 1856 to the present.
291. **Byron, Shelley, and Keats.** 4 hours. Major figures of the second generation of Romantics.
301. **Introduction to the English Language.** 4 hours. English as a language. The basic concepts of general description and comparative linguistics are used to examine the relationship of English to other languages, its history, and its present structure.
302. **Browning and Tennyson.** 4 hours. The works of the two representative Victorian poets, studied in depth.
303. **Carlyle and Mill.** 4 hours. Major works.
305. **Newman and Arnold.** 4 hours. The prose of one early and one mid-Victorian writer: their contributions to nineteenth century religious and educational theories; Arnold's literary and social criticism: the rhetoric of both. Brief reference to the poems and letters of each that most closely parallel ideas and moods in their prose.
306. **Dickens and Thackeray.** 4 hours. Major writings of the two representative Victorian novelists.
307. **Yeats and Eliot.** 4 hours. Specific texts. The intellectual and spiritual attitudes represented by each poet.
310. **American Puritanism.** 4 hours. Writings, from William Bradford to Jonathan Edwards. Major aspects of Puritan life and thought.
311. **Chaucer.** 4 hours. Readings in the major works.
315. **Senior Tutorial Seminar.** 4 hours. For English majors, under the direction of an assigned faculty member. The tutor bases the work on the student's particular needs or interests.
316. **American Drama.** 4 hours. The major dramatic writings in American literature.
321. **Medieval Literature, I.** 4 hours. Selected works in Middle English and Continental medieval writings in English translation.
322. **Medieval Literature, II.** 4 hours. Continues Engl. 321.
335. **Literary Criticism, Theory, and Practice.** 4 hours. Major critics from Plato to the present.
336. **Renaissance Drama Exclusive of Shakespeare.** 4 hours. Major dramatic works of Shakespeare's contemporaries.
338. **Tragedy.** 4 hours. Representative tragedies from the Greeks to the present.
339. **Comedy.** 4 hours. The history and theory of comic drama.
340. **English and American Satire.** 4 hours. Selected writings.
342. **The Poetry of Milton.** 4 hours. Origins, forms, artistic and ethical values; Milton's place in English literary history.
345. **The Metaphysical Poets.** 4 hours. Donne to Crashaw. Class reading and discussion of the poetry of Donne, Herbert, Vaughan, Crashaw. Special emphasis on the poetry of Donne.

347. **Drama of the Restoration and 18th Century.** 4 hours. Major works after the reopening of the public theaters in 1660; development from aristocratic Baroque tragedy and comedy to bourgeois sentimental drama and other forms. Dryden, Etherege, Wycherley, Congreve, Vanbrugh, Farquhar, Steele, Goldsmith, Sheridan, and others.
349. **Dr. Johnson and His Circle.** 4 hours. Johnson, Boswell, Goldsmith, Reynolds, Burke, Gibbon, and Sheridan. The position of Johnson's circle in the social and literary life of the second half of the eighteenth century.
350. **The American Transcendentalists.** 4 hours. The Transcendentalist circle in and about Concord, 1830-1860: Emerson and Thoreau; Alcott, Brownson, Ripley, Parker, Channing, and others. Prerequisite: Any one of the following: Engl. 113 or 255; Hist. 356 or 357; Phil. 309 or 313.
355. **American Fiction from 1800 to 1860.** 4 hours. Background and development of traditions and themes in American fiction from 1800 to 1860. Prerequisite: Engl. 113 or 255.
364. **Readings in the Lyric, I: European.** 4 hours. Selections from Sappho, Catullus, Petrarch, Villon, San Juan de la Cruz, Goethe, Leopardi, Baudelaire. Students must have a reading knowledge of at least one of the foreign languages involved.
365. **Readings in the Lyric, II: English.** 4 hours. Selected lyrics from the thirteenth through the nineteenth century.
366. **Readings in the Lyric, III: 20th Century.** 4 hours. Selections from Yeats, Valery, Rilke, Frost, Montale, Garcia Lorca, Auden. Students are expected to have a reading knowledge of at least one of the foreign languages involved.
375. **Henry James and the Technique of Fiction.** 4 hours. Development of Henry James as a novelist.
380. **Mark Twain and the Rise of Realism.** 4 hours. The rise of realism in American fiction from 1850 to 1900; emphasis upon Mark Twain. Prerequisite: Engl. 236.
382. **The Plays of Bernard Shaw.** 4 hours. A critical, social, and philosophical inquiry.
386. **Hawthorne and Melville.** 4 hours. Two major writers of the nineteenth century; detailed analysis of one major novel of each. Prerequisite: Engl. 113 or 255.
387. **The Structure of English.** 4 hours. Traditional and structuralist grammatical descriptions; introduction to transformational grammatical studies; detailed survey of a transformational syntax of English; brief introduction to generative phonology and morphophonemic analysis of English, especially stress. Prerequisite: Engl. 301.
388. **Southern Fiction.** 4 hours. Major works from the southern United States.
389. **Whitman and Dickinson.** 4 hours. Poetry and major prose of Whitman; poems of Dickinson.

FINANCE

240. **Money and Banking.** 3 hours. Monetary and banking systems; the Federal Reserve System; monetary theory; price fluctuation; foreign-exchange financing; specialized financial institutions in the United States. Prerequisite: Econ. 121.
341. **Business Finance.** 3 hours. Nature of business finance and its relation to economics, accounting, and law; legal nature and forms of business enterprise; capital, capitalization, and financial planning; financial analysis and interpretation; initial financing, refinancing, working capital; income administration, including

dividend policies; expansion; internal and external financial and economic relationship of the firm. Prerequisite: Econ. 121.

342. **Investments.** 3 hours. Types and distinguishing features of securities; security markets; analysis of financial statements and principles of valuation quality differences; selection of securities to meet varying personal and institutional objectives. Prerequisite: Fin. 240, 341.
343. **Risk and Insurance.** 3 hours. Basic principles; applications in different areas (life and property insurance); management of risks in the firm (insurance vs. self-insurance); social and economic significance of insurance in the economy. Prerequisites: Fin. 240, 341.
344. **Investment Policy.** 3 hours. Varying conditions to meet diverse objectives; investments for individuals, business firms, banks, insurance companies, pension and profit-sharing funds; interrelation of investment policies and the economic environment. Prerequisites: Fin. 342. Econ. 323 is recommended.
345. **Problems in Business Finance.** 3 hours. Case studies of problems involving capital budgeting; administration of assets; calculation of financial requirements; provision of funds; dividend policies; special financial problems. Prerequisites: Fin. 342 and 343 or 344.

FRENCH

101. **Elementary French.** 4 hours; seniors, 3 hours. Grammar, pronunciation, reading, composition, conversation. For students who have not studied French. Note: A student must have credit in Fr. 101, 102, 103 to receive graduation credit in 101. One additional hour per week in the language laboratory.
102. **Elementary French.** 4 hours; seniors, 3 hours. Continues Fr. 101. No graduation credit for Fr. 102 without 103. One additional hour per week in the language laboratory. Prerequisite: Fr. 101 or equivalent.
103. **Elementary French.** 4 hours; seniors, 3 hours. Continues Fr. 101 and 102. One additional hour per week in the language laboratory. Prerequisite: Fr. 102 or equivalent.
104. **Intermediate French.** 4 hours. Rapid reading of modern authors, syntax and composition, conversation practice. Prerequisite: Fr. 103 or two years of high school French.
105. **Intermediate French.** 4 hours. Continues Fr. 104. Prerequisite: Fr. 104 or equivalent.
106. **Intermediate French.** 4 hours. Continues Fr. 104 and 105. Prerequisite: Fr. 105 or equivalent.
113. **Conversational Practice.** 2 hours. Oral practice for the development of elementary conversational skill and improvement of pronunciation. Supplements Fr. 104, 105, and 106. Open only to students concurrently enrolled in any one of these courses. Prerequisite: Fr. 103 or two years of high school French.
121. **Elementary French. Honors Course.** 5 hours. Grammar, pronunciation, reading, composition, conversation. Open only to James Scholars and others with superior linguistic ability. Completion of Fr. 121, 122 and 123 leads directly to Fr. 105. Practice in the language laboratory is required. Prerequisite: Consent of the department.

122. **Elementary French: Honors Course. 5 hours.** Continues Fr. 121. Practice in the language laboratory is required. Individual projects and readings are assigned. Prerequisite: Fr. 121.
123. **Elementary French: Honors Course. 5 hours.** Continues Fr. 121 and 122. Practice in the language laboratory is required. Individual projects and readings are assigned. Prerequisite: Fr. 122.
201. **Introduction to French Literature, I. 3 hours.** Reading of selected masterpieces. Prerequisite: Fr. 106 or four years of high school French.
202. **Introduction to French Literature, II. 3 hours.** Continues Fr. 201. Prerequisite: Fr. 106 or four years of high school French.
203. **Introduction to French Literature, III. 3 hours.** Continues Fr. 202. Prerequisite: Fr. 106 or four years of high school French.
209. **Conversation, I. 3 hours.** Conversational practice to develop oral facility; exercises for the improvement of pronunciation and diction. Prerequisite: Fr. 106 or four years of high school French.
210. **Conversation, II. 3 hours.** Continues Fr. 209. Prerequisite: Fr. 209.
211. **Composition. 3 hours.** Training in writing French, translation from English, free composition. Prerequisite: Fr. 106 or four years of high school French.
216. **French Literature in Translation. 4 hours.** Reading of selected masterpieces of French literature in English translation. Not open to students majoring or minoring in French. Prerequisite: Sophomore standing or consent of instructor.
282. **Teachers Course. 3 hours.** Resources, classroom materials, standard practices, and problems in the teaching of French; practical application to actual classroom situations. Prerequisite: Fr. 201, 202, 203, 209, 210, 211.
293. **Tutorial Course. 3 hours.** For seniors majoring in French; supplements regular courses. Individual projects and readings are assigned. Prerequisite: senior standing.
294. **Tutorial Course. 3 hours.** For seniors majoring in French; supplements regular courses. Individual projects and readings are assigned. Prerequisite: Senior standing.
317. **Modern French Drama, I. 3 hours.** Major dramatists of the nineteenth and twentieth centuries. Prerequisite: Fr. 201, 202, 203, or equivalent or consent of instructor.
318. **Modern French Drama, II. 3 hours.** Continues Fr. 317. Prerequisite: Fr. 201, 202, 203, or equivalent, or consent of instructor.
319. **Modern French Drama, III. 3 hours.** Continues Fr. 317 and 318. Prerequisite: Fr. 201, 202, 203, or consent of instructor.
331. **French Novel of the Nineteenth Century, I. 3 hours.** Major novelists. Prerequisite: Fr. 201, 202, and 203, or equivalent.
332. **French Novel of the Nineteenth Century, II. 3 hours.** Continues Fr. 331. Prerequisite: Fr. 201, 202, and 203, or equivalent.
333. **French Novel of the Nineteenth Century, III. 3 hours.** Continues Fr. 331 and 332. Prerequisite: Fr. 201, 202, 203, or equivalent.

GEOGRAPHY

101. **Physical Geography, I: Landforms and Mineral Resources. 4 hours.** The earth and its resources; the earth grid and its portrayal on maps; interpretation of landforms from a geographic point of view; occurrence and use of mineral resources.

102. **Physical Geography, II: Earth-Sun Relations and Elements of Weather.** 4 hours. Planetary relations; the atmosphere, its composition, function, and behavior in the production of weather types; air masses and air-mass analysis.
103. **Physical Geography, III: Climate, Vegetation, and Soils.** 4 hours. Climatic types and climatic regions; factors that give order and logic to their areal distribution; biotic and edaphic types and regions in relation to climatic phenomena. Prerequisite: Geog. 102.
104. **Cultural Geography, I: World Regional Geography.** 5 hours. Geographic structure of the world; regional patterns of settlement and land utilization; man's occupancy of the world.
105. **Cultural Geography, II: World Patterns of Production.** 4 hours. Man's utilization of the major economic resources of the world; geographic patterns and the utilization of resources.
109. **Basic Maps and Graphics.** 4 hours. The use of maps and other graphic materials. Demonstration and evaluation of slides, films, prints, models, and maps for teaching and other purposes. Preparation of representative graphic materials.
114. **Conservation of Natural Resources.** 4 hours. The conservation of soils, water, biotic, mineral, and recreational resources; general principles of conservation as they apply to the United States. Prerequisite: Sophomore standing or one course in geography. Individual readings and projects are assigned.
123. **Geography of Illinois.** 3 hours. Detailed regional study of the state; special emphasis on the cultural relations of Illinois to the rest of the nation. Prerequisite: One course in geography.
221. **The United States and Canada.** 4 hours. The principal economic activities in each of the major geographic regions of North America; their relation to the natural environment. The regional equipment for industry in the several divisions of the continent. Problems and outlook in the major regions of the United States and Canada. Prerequisite: 10 hours of geography or consent of the instructor.
225. **South America.** 4 hours. Regional geography; physical regions, people, economic resources, and political alignments. Prerequisite: 10 hours of geography or consent of the instructor.
303. **Advanced Physical Geography, III: Climates of the Continents.** 4 hours. The world's climates; controls and distribution; problems of classification and regional analysis. Individual projects and readings are assigned. Prerequisite: Geog. 103.
331. **Western Europe.** 4 hours. A regional analysis of the economic, social, and political development of people in relation to (1) the location of Europe and its natural regions and (2) the physical elements of land relief, climate, soil, and other natural resources. Special emphasis is given to Britain, France, and Germany and to the more critical natural resources. Prerequisite: 10 hours of geography or consent of the instructor.
333. **Southern and Eastern Asia.** 4 hours. Physical and cultural landscapes of the rim of Asia; physical regions, people, mineral wealth, agricultural production, manufacturing, trade, political alignments. Prerequisite: 12 quarter hours of geography or consent of instructor.
336. **The U.S.S.R.** 4 hours. Physical and cultural landscapes; regional analysis of resources and economy; the geographic basis of the nation's role in world affairs. Prerequisite: 10 hours of geography or consent of instructor.
338. **Africa South of the Sahara.** 4 hours. A regional analysis of the relationship between natural resources, economic development, and the evolution of the many political units. Prerequisite: 8 hours of geography or consent of instructor.
351. **Cartography.** 4 hours. Presentation of data on maps, charts, and graphs; evaluation of source materials; writing of map specifications; use and care of

cartographic equipment; techniques of graphic reproduction; emphasis is on the problems of map construction for reproduction.

361. **Agricultural Regions and Land Utilization.** 4 hours. The nature of land utilization from the world, continental, and regional viewpoints; the types of agricultural land use; the interrelationships between areas of different types of land use.
363. **Manufacturing Regions of the World.** 4 hours. World distribution of manufacturing industries. The relative importance of industry in the major economics of the world; factors in the location of principal types of manufacturing; detailed analysis of selected industrial districts.
365. **Geographic Aspects of Transportation.** 4 hours. Principles; world patterns of land, air, and sea transportation routes, facilities and traffic; relations of transportation to regional development; selected problems in the geographic aspects of railway, highway, and pipe-line transportation. Individual projects and readings are assigned.
371. **Urban Geography.** 4 hours. Distribution of cities; urban patterns, forms and functions; classification of urban centers and tributary areas; systems of urban land classification; forces affecting urban land uses; the geographic aspects of city planning.
375. **Historical Geography of the United States and Canada.** 4 hours. A regional analysis of the effect of climate, soils, water bodies, and topography on the settlement of the continent; their relationship to present sectional differences. The correlation of history and geography is stressed. Individual projects and readings are assigned.
377. **Political Geography.** 4 hours. World pattern of nations in relation to their natural environment; population and economic factors in world affairs; emphasis on regional concepts and problems of the non-Western world. Individual projects and readings are assigned.
399. **Special Studies in Geography.** 2-5 hours. Readings and reports in selected fields, chosen in consultation with the instructor. Prerequisite: Senior standing and consent of the instructor.

GEOLOGY

101. **Principles of Geology, I.** 4 hours. The origin and age of the earth, composition and structure. The rock cycle.
102. **Principles of Geology, II.** 4 hours. The geologic cycle and the origin of the surface features of the earth. Prerequisite: Geol. 101, first quarter, or equivalent, of the physical sciences survey course or consent of instructor.
103. **Principles of Geology, III.** 4 hours. Evolution of the earth and its life. Prerequisite: Geol. 102 or consent of the instructor.
110. **Field Work.** 3 hours. Observation in St. Francois Mountains and adjacent parts of Missouri and Illinois. Registration, winter quarter. Two three-hour class meetings. Held during spring vacation. Credit is given on completion of a satisfactory written report. Prerequisite: Geol. 102, 150, or PSci. 102.
111. **Principles of Geology.** 1 hour. For honors students. Field, laboratory, and/or library work. The course may be taken three times, each time with co-registration in Geol. 101, 102, or 103 or once with co-registration in Geol. 150. Prerequisite: Concurrent registration in the honors section of Geol. 101, 102, 103, or 150, or consent of the instructor.

150. **Geology for Engineers.** 4 hours. Application of elementary geology to engineering. Prerequisite: Sophomore standing in the College of Engineering.
204. **Crystallography.** 4 hours. Morphological, optical, and introductory structural crystallography; features of mineralogical significance. Prerequisite: One quarter of college chemistry.
205. **Mineralogy.** 4 hours. Origin and properties of common minerals.. Crystal chemistry of major mineral groups. Laboratory study and identification of minerals and rocks. Prerequisite: Geol. 204.
206. **Petrology.** 4 hours. Origin, occurrence, and properties of igneous, metamorphic, and sedimentary rocks. Petrographic study, lecture, and laboratory. Prerequisite: Geol. 205.
218. **Introduction to Paleontology.** 4 hours. Same as BioS. 218. The phylogeny, morphology, and ecology of fossils; emphasis on the invertebrates. Prerequisite: One year of biology or consent of the instructor.
219. **Stratigraphy and Sedimentation, I.** 4 hours. Origin, description, and interpretation of sedimentary rocks. Prerequisite: Geol. 103.
220. **Stratigraphy and Sedimentation, II.** 4 hours. Continues Geol. 219. Prerequisite: Geol. 219.
240. **Economic Geology.** 4 hours. Principles and techniques of mineral exploration, evaluation, and exploitation. Origin and occurrence of economic mineral materials, including petroleum and natural gas. Prerequisite: Consent of the instructor.
290. **Introduction to Research.** Credit to be arranged. Independent study. Each student who desires to register must present to the head of the department a written statement from the instructor under whom he is to work. Only those students who write a thesis are recommended for graduation with departmental distinction. Prerequisite: Consent of the instructor.
303. **Advanced Physical Geology, I.** 4 hours. The physical nature of the earth; the manner in which the materials of the earth determine its erosion and its structure. Prerequisite: A year of chemistry, physics and calculus, geology.
304. **Advanced Physical Geology, II.** 4 hours. The chemical nature and history of the earth's crust. Prerequisite: Geol. 303.
316. **Invertebrate Paleontology.** 4 hours. Same as Biol. 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisite: Geol. 218 and consent of the instructor.
317. **Field Geology in the Rocky Mountains.** 12 hours. Conducted from a locality in the Rocky Mountains. Field training in stratigraphy, structure, and geomorphology; geologic mapping with plane table and serial photographs. Approximate cost \$250 to \$305. Prerequisite: Geol. 103 or consent of the instructor.
318. **Vertebrate Paleontology.** 4 hours. Same as Biol. 318. Phylogeny, morphology, and ecology of the fossil vertebrates.
319. **Paleobotany.** 4 hours. Same as Biol. 319. Prerequisite: One quarter of botany.
335. **Geochemistry.** 4 hours. Principles of the distribution of the elements in the earth's crust. Geologically pertinent phase equilibria. Geochronology and isotope distributions in the earth's crust. Prerequisite: Consent of the instructor.
340. **Introduction to Oceanography.** 4 hours. A physical description of the marine environment: The physical and chemical properties of sea water; currents, wave action, tidal forces, geography and geology of the ocean basins. Relation of the marine organism to the physical environment. Prerequisite: Consent of the instructor.
345. **Advanced Crystallography.** 4 hours. Crystalline properties of minerals. Theory and practice of determining the crystalline structure of minerals. Prerequisite: Geol. 205 or consent of the instructor.

350. **Hydrogeology. 4 hours.** The occurrence, storage, movement, and quality of water in rocks of the earth's crust. Prerequisite: Calculus or concurrent registration in calculus.
360. **Introductory Geophysics. 4 hours.** The shape and figure of the earth, gravity, seismology, and magnetism. Thermodynamics of the earth; atmospheric and planetary geophysics. Prerequisite: Consent of instructor.
370. **Engineering Geology. 4 hours.** Applications of geology to major engineering problems and operations. Prerequisite: Geol. 150 or consent of the instructor.

GERMAN

101. **Elementary German. 4 hours.** Note: A student must have credit in Ger. 101, 102, 103 to receive graduation credit in 101. Reading, grammar, and simple oral practice. Two hours per week in the language laboratory.
102. **Elementary German. 4 hours.** A student must have credit in Ger. 103 to receive graduation credit in 102. Continues Ger. 101. Two hours per week in the language laboratory. Prerequisite: Ger. 101 or equivalent.
103. **Elementary German. 4 hours.** Continues Ger. 102. Two hours per week in the language laboratory. Prerequisite: Ger. 102.
104. **Intermediate German. 4 hours.** Reading, grammar review, and oral communication. Two hours per week in the language laboratory. Prerequisite: Ger. 103 or 122 or equivalent.
105. **Intermediate German. 4 hours.** Continues Ger. 104. Two hours per week in the language laboratory. Prerequisite: Ger. 104 or 123 or equivalent.
106. **Intermediate German. 4 hours.** Continues Ger. 105. Two hours per week in the language laboratory. Prerequisite: Ger. 105 or 125 or equivalent.
108. **Intensive German. 5 hours.** An accelerated course for beginners. Primarily for those seeking reading ability in technical material in the humanities, social sciences, and natural sciences. Open to juniors and seniors. Does not fulfill the University language requirement.
109. **Reading German. 3 hours.** Practice in reading and analyzing technical material in the various fields of specialization. Open to juniors and seniors. Does not fulfill the University language requirement. Prerequisite: Ger. 108 or equivalent.
113. **Intermediate Composition and Conversation, I. 2 hours.** Prerequisite: Concurrent enrollment in or completion of Ger. 104.
114. **Intermediate Composition and Conversation, II. 2 hours.** Continues Ger. 113. Prerequisite: Ger. 113 or equivalent. Open also by permission to students who have completed Ger. 103 with A or B grades.
115. **Intermediate Composition and Conversation, III. 2 hours.** Continues Ger. 114. Prerequisite: Ger. 114. Open also by permission to students who have completed Ger. 105 with A or B grades.
121. **Elementary German. 5 hours.** Honors course. Reading, grammar, and simple conversation. Four classes and three hours in the language laboratory per week. Prerequisite: James Scholar status or permission of the department.
122. **Elementary German. 5 hours.** Honors course. Continues Ger. 121. Four classes and six half hours per week in the language laboratory. Prerequisite: Ger. 121 or equivalent and permission of the department.
123. **Elementary German. 5 hours.** Honors course. Continues Ger. 122. Four classes and three hours in the language laboratory per week. Prerequisite: Ger. 122 or equivalent and permission of the department.

134. **Intermediate German. 5 hours.** Special course. Reading, writing, understanding, and speaking. Primarily for prospective German majors, but open to others. Four classes and three hours in the language laboratory per week. Prerequisite: Ger. 103 or equivalent.
135. **Intermediate German. 5 hours.** Special course. Continues Ger. 134. Four classes and three hours in the language laboratory per week. Prerequisite: Ger. 134, or 104 and 113, or equivalent.
136. **Intermediate German. 5 hours.** Special course. Continues Ger. 135. Four classes and three hours per week in the language laboratory. Prerequisite: Ger. 135, or 105 and 114, or equivalent.
201. **Writing and Speaking German, I. 3 hours.** Phonetics, grammar, syntax, vocabulary development; training in oral and written communication. Prerequisite: Ger. 106 or equivalent.
202. **Writing and Speaking German, II. 3 hours.** Continues Ger. 201. Prerequisite: Ger. 201 or equivalent.
203. **Writing and Speaking German, III. 3 hours.** Continues Ger. 202. Prerequisite: Ger. 202 or equivalent.
216. **German Literature in Translation. 4 hours.** Significant works, from Lessing to the present. Prerequisite: Sophomore standing or consent of the department.
218. **Franz Kafka. 4 hours.** Given in English. An intensive study of the major works and selections from the short stories, letters, and diaries. Not open to freshmen and sophomores without permission of the instructor.
219. **Thomas Mann. 4 hours.** Given in English. A detailed study of the three major novels and selections from the short stories and essays. Not open to freshmen and sophomores without permission of the instructor.
221. **Introduction to German Literature. 4 hours.** A linguistic and literary introduction to the various genres. Prerequisite: Ger. 106 or equivalent.
296. **Masterworks of German Literature, I. 4 hours.** The classical period. Prerequisite: Ger. 221 or equivalent.
298. **Masterworks of German Literature, II. 4 hours.** Romanticism and poetic realism. Prerequisite: Ger. 221 or equivalent.
299. **Independent Study. 1-3 hours.** May be repeated for credit. Open only to German majors working on special projects. Prerequisite: Ger. 104 or equivalent; consent of the department.
300. **Masterworks of German Literature, III. 4 hours.** Naturalism to the present. Prerequisite: Ger. 221.
301. **Writing and Speaking German, IV. 3 hours.** Continues Ger. 203. Prerequisite: Ger. 203 or equivalent.
302. **Writing and Speaking German, V. 3 hours.** Continues Ger. 301. Prerequisite: Ger. 301 or equivalent.
305. **History of the German Language. 3 hours.** The structural and lexical development; its relationship to other languages. Prerequisite: Ger. 203, 296, and 298 or equivalent.
331. **The Teaching of German in the Secondary School and College. 5 hours.** Modern techniques in the teaching of German, including the language laboratory. Prerequisite: Ger. 203 and one course in German literature.
350. **Senior Seminar and Thesis, I. 3 hours.** Primarily for candidates for honors in German. Prerequisite: Ger. 203, 296, 298 and at least a B average in previous German courses.

351. **Senior Seminar and Thesis, II.** 3 hours. Continues Ger. 350. Prerequisite: Ger. 350.
385. **The German Novelle.** 4 hours. Reading and interpretation of representative Novellen of the nineteenth and twentieth centuries. Prerequisite: Ger. 298 or equivalent.
395. **Naturalism, Impressionism, and Expressionism.** 4 hours. An intensive study of the literature and programmatic writing of the period 1885-1925. Prerequisite: Ger. 202, 300, or equivalent.
396. **German Drama.** 4 hours. The development of the German drama from the Enlightenment to the present. Prerequisite: Ger. 202, 221, and one other course in German literature or equivalent.
397. **German Romanticism.** 4 hours. The literature, theories, and philosophy of eighteenth and nineteenth century German Romanticism. Prerequisite: Ger. 202, 296, and 298 or equivalent.
398. **Goethe's Faust.** 4 hours. An intensive study of Parts I and II. Prerequisite: Ger. 202, 296, and 298 or equivalent.
399. **Independent Study for Seniors and Graduates.** 1-3 hours. May be repeated for credit. Open only to German majors working on specialized research. Prerequisite: Consent of the department.

GREEK

101. **Elementary Greek, I.** 4 hours. Note: A student must have credit in Gr. 102 to receive graduation credit in 101. The fundamentals of ancient classical Greek, including the reading of simple prose.
102. **Elementary Greek, II.** 4 hours. Continues Gr. 101. Grammar and reading. Prerequisite: Gr. 101 or equivalent.
103. **Elementary Greek, III.** 4 hours. Continues Gr. 102. Prerequisite: Gr. 102 or equivalent.
104. **Intermediate Greek, I.** 4 hours. Introduction to epic poetry. Reading of Homer. Prerequisite: Gr. 103 or equivalent.
105. **Intermediate Greek, II.** 4 hours. Continues Gr. 104. Introduction to dramatic poetry. Prerequisite: Gr. 104 or equivalent.
106. **Intermediate Greek, III.** 4 hours. Introduction to philosophic prose: Study of Plato's Socratic dialogues. Prerequisite: Gr. 105 or equivalent.

HEALTH SCIENCE

180. **Personal and Community Health.** 3 hours. Fundamentals of medical science; dynamics of health in the individual, the family, and the community. Scientific prevention of illness; health protection; principles of treatment of common medical problems.
240. **Mental Health in the Modern Urban Community: Problems and Prospects.** 3 hours. Definition of urban problems and their impact upon the mental health of the individual, the family, and the community. Health, education, housing, ethnic, racial, employment, criminal, and other factors that impinge on individuals and families. Evaluation of programs for prevention and processes of treatment from the viewpoint of the individual and the community.

HISTORY

115. **The Western World, 1715-1815.** 4 hours. The major social, intellectual, and political developments from the Enlightenment to the end of the Napoleonic era.
116. **The Western World, 1815-1914.** 4 hours. The major social, intellectual, and political developments from the age of Metternich to the Liberal disillusion of 1914.
117. **The Western World, 1914 to Present.** 4 hours. The major social, intellectual, and political developments.
131. **History of England to 1485.** 4 hours. England from the Celtic emigrations to the accession of Henry VII.
132. **History of England, 1485-1714.** 4 hours. England during the reigns of the Tudors and the Stuarts.
133. **History of England, 1714 to the Present.** 4 hours. England from the accession of the Hanoverians to the present.
151. **History of the United States to 1815.** 4 hours. From colony to nationhood: European foundations; colonial developments; independence and early nationhood.
152. **History of the United States, 1815-1890.** 4 hours. America in the nineteenth century: the making of an independent nation; Jacksonian democracy; the coming of the Civil War and Reconstruction; the Industrial Revolution.
153. **Modern America (1890 to the Present).** 4 hours. American politics in the twentieth century; adjustment to world power; problems of economic and social change in modern times.
175. **History of Europe, 476-1100.** 4 hours. Political, cultural, social, and economic developments: the barbarian invasions, the influence of Byzantium and Islam, the Carolingian Empire, the church and the papacy, monasticism, the Vikings, and the rise of feudal monarchies. Prerequisite: Sophomore standing.
176. **History of Europe, 1100-1450.** 4 hours. From the Crusades to the Renaissance. Political, cultural, social, and economic developments: the establishment and decline of medieval culture, institutions and ideals, the conflict of Empire and papacy, the rise of towns, estates and national monarchy, problems of international politics. Prerequisite: Sophomore standing.
177. **History of Europe, 1450-1715.** 4 hours. From the Renaissance to the death of Louis XIV. Political, cultural, social, and economic developments: The Renaissance, the Reformation, the growth of commercial capitalism, exploration, empire and the New World, the growth of French absolutism, international politics, political theory and the new science. Prerequisite: Sophomore standing.
181. **The Ancient World: Prehistory and the Ancient Orient.** 3 hours. Ancient civilizations prior to the Greeks. Prerequisite: Sophomore standing.
182. **The Ancient World: Greece to the Age of Alexander and the Early Roman Republic.** 3 hours. Greek civilization and the early years of the Roman Republic. Prerequisite: Sophomore standing.
183. **The Ancient World: Later Roman Republic and the Roman Empire.** 3 hours. Roman civilization from the final years of the Roman Republic through the Roman Empire. Prerequisite: Sophomore standing.
223. **Russia from the Varangians to Peter the Great.** 3 hours. The Russian people, state, and culture—from their origins to the death of Peter the Great (1725). Prerequisite: One year of European history or consent of instructor.
224. **Russia in the Imperial Age.** 3 hours. Political, diplomatic, intellectual, and social developments in the Russian Empire from the death of Peter the Great to the Revolution of 1905. Prerequisite: One year of European history or consent of the instructor.

225. **The Russian Revolution and the New Regime.** 3 hours. Russian and Soviet political, diplomatic, ideological, economic, social, and cultural developments during the Duma period, World War I, the Russian Revolution and War Communism, the NEP, the Five Year Plans. Prerequisite: One year of European history or consent of the instructor.
305. **The Middle Ages from A.D. 400 to 814.** 3 hours. Europe from the time of the barbarian invasions to the death of Charlemagne.
306. **The Middle Ages from 814 to 1250.** 3 hours. Europe from the death of Charlemagne to the death of Frederick II.
307. **The Middle Ages from 1250 to 1500.** 3 hours. Europe from the rise of the towns to the establishment of national monarchy.
308. **The Renaissance.** 3 hours. Major intellectual, cultural, political, social, and economic developments and issues of Renaissance Europe.
311. **The Age of the Reformation.** 3 hours. The Protestant and Catholic reformations of the sixteenth century.
314. **Europe in the Seventeenth Century.** 3 hours. Major political, religious, cultural, social, and economic developments and issues of seventeenth century Europe.
315. **Europe in the Eighteenth Century.** 3 hours. The major social, intellectual, political, and economic developments of the Age of the Enlightenment, from the War of the Spanish Succession to the French Revolution.
316. **Revolution and Reaction: 1789-1848.** 3 hours. The French Revolution; Napoleon and the emergence of a new Europe struggling with the forces of liberalism, nationalism, romanticism, and conservatism; the meeting of these forces in the revolutions of 1848.
317. **Unification, Power, and Conflict: 1848-1914.** 3 hours. The unification of Germany and Italy, the rise of industrialism and the new imperialism, the advent of *Realpolitik* and the background of World War I.
318. **Power, Conflict, and the Cold War: 1914 to the Present.** 3 hours. The contentions among fascism, communism, and liberal democracy to reconstitute Europe after 1918. The background of World War II and Europe in a cold war.
323. **Ideas and Ideologies in Nineteenth Century European Thought.** 4 hours. Major ideas, from Romantic escapism to the mechanistic world-view of the Social Darwinists. Individual projects and readings are assigned. Prerequisite: One year of modern European history.
324. **Ideas and Ideologies in Twentieth Century European Thought.** 3 hours. Important intellectual trends in the modern world; the content and the impact of such phenomena as Freudianism and the new science of man, Spenglerian "decline of the west," Marxism-Leninism, the irrationalism of totalitarian fascism, the post-war Existentialist dilemma. Prerequisite: One year of modern European history and Hist. 323.
327. **German History from 1618 to 1740.** 3 hours. The Thirty Years' War: its political, economic, and social effects on German public life. The rise of absolutism, the decline of the Reich, economic reconstruction and Cameralism, the changing structure of social relationships.
328. **German History from 1740 to 1848.** 3 hours. The rise of Prussia and Austro-Prussian dualism; enlightened absolutism in Germany; Germany in the Revolutionary period; the rise of political ideologies and middle-class culture; the revolutions of 1848.
329. **Modern Germany: 1848 to the Present.** 3 hours. Germany's political, economic, and social reaction to the problems of national unification, industrialism, liberalism, world-power status and rejuvenation after the loss of that status in the two World Wars.

337. **Tudor England. 3 hours.** The establishment of the Tudor monarchy, the rise of middle-class influence, the growth of Parliament, the Reformation, foreign affairs, economic and social issues.
338. **Stuart England. 3 hours.** The Puritan issue, the challenge of Parliament, the civil wars, Cromwell and the Commonwealth, constitutional monarchy and the crisis of 1688, foreign affairs, the colonies, the new science, social and economic problems.
339. **Eighteenth Century England, 1714-1815. 3 hours.** From the accession of the Hanoverians to the end of the Napoleonic Wars.
340. **History of England in the Nineteenth Century, 1815-1886. 3 hours.** From the end of the Napoleonic Wars to the Home Rule election.
341. **Twentieth Century England, 1886 to the Present. 3 hours.** From the Home Rule election to the present.
343. **English Constitutional History to 1485. 3 hours.** Major developments in the areas of central and local government and in the legal system of England from the Anglo-Saxon era to the accession of the Tudors in 1485.
344. **English Constitutional History, 1485 to the Present. 3 hours.** Major developments within the institutions of central and local government, the appearance of new institutions, and the relations of Britain to her Empire and Commonwealth.
351. **Discovery and Settlement of the Americas in the 16th and 17th Centuries. 3 hours.** The development of the Americas; early phases of European interests in the Atlantic Community; the first century of British North America. Prerequisite: One year of history or consent of the instructor.
352. **British North America, 1690-1765. 3 hours.** The duel for empire with France; the development of British North America to the "Eve of American independence." Prerequisite: One year of history or consent of the instructor.
353. **The Development of the American Nation, 1765-1801. 3 hours.** The background for independence; the American Revolution; the establishment of government. Prerequisite: One year of history or consent of the instructor.
354. **The New Nation. The United States, 1789-1828. 3 hours.** Achieving stability and establishing direction under the Constitution. Westward expansion; economic growth; emerging sectionalism. Prerequisite: One year of history or consent of the instructor.
355. **The Jacksonian Age. The United States, 1828-1848. 3 hours.** Selected topics. Prerequisite: One year of history or consent of the instructor.
356. **Expansion and Conflict. The United States, 1848-1877. 3 hours.** The anti-slavery movement and sectional conflict; Civil War and Reconstruction. Prerequisite: One year of history or consent of the instructor.
357. **The Politics of Reform in Industrial America, 1877-1912. 3 hours.** Agrarian protest, organization of labor, third party movements, and progressivism in the period of rapid social and economic change at the turn of the century. Prerequisite: One year of history or consent of the instructor.
358. **Response to Crisis: 20th Century America in War and Depression, 1912-1939. 3 hours.** The American response to World War I and to the depression of the 1930's. An analysis of political, social, economic, and intellectual tendencies. Prerequisite: One year of history or consent of the instructor.
359. **Studies in Contemporary American History: the United States, 1939 to the Present. 3 hours.** World War II; post-war diplomacy; political, social, economic, and intellectual tendencies. Prerequisite: One year of history or consent of the instructor.
369. **Constitutional Development of the United States to 1840. 3 hours.** Prerequisite: One year of United States history, British history, or political science.

370. **Constitutional Development of the United States from 1840 to 1900.** 3 hours. Prerequisite: One year in college of United States history, British history, or political science.
371. **Constitutional Development of the United States in the 20th Century.** 3 hours. Prerequisite: One year of United States history, British history, or political science.
373. **American Urban History: Colonial Period to 1880.** 3 hours. Major causes for and consequences of the emergence of cities in American society—seventeenth century through 1880. Prerequisite: One year of United States history or consent of the instructor.
374. **American Urban History: 1880 to the Present.** 3 hours. Major causes for and consequences of the emergence of the industrialized city in American society—1880 to the present. Prerequisite: One year of United States history or consent of the instructor.
375. **Studies in American Urban History.** 3 hours. Individual training in research in urban history and discussion of selected major problems of American urbanization. Prerequisite: Hist. 373 and 374 or consent of the instructor.
377. **American Negro History. Colonial Period Through Reconstruction.** 3 hours. The history of the Negro in America and Negro-White race relations, from the seventeenth century through 1877.
378. **American Negro History: Reconstruction Through the Present.** 3 hours. The history of the Negro in America and Negro-White race relations, 1877 to present. Prerequisite: One year of United States history or consent of instructor.
379. **Studies in American Negro History.** 3 hours. Individual training in research in American Negro history and examination of select major problems. Prerequisite: Hist. 377 and 378 or consent of instructor.

HUMANITIES

101. **World Literature, I: The Ancient World.** 4 hours. Masterpieces of world literature from earliest times to the present, in English and in translation from original foreign languages.
102. **World Literature, II: The World of the Middle Ages and the Renaissance.** 4 hours. Continues Hum. 101.
103. **World Literature, III: The Modern World from 1700 to the Present.** 4 hours. Continues Hum. 102.
106. **World Literature, I. 1715-1815.** 4 hours. First part of a three-course sequence covering masterpieces from the death of Louis XIV to the Congress of Vienna. In English and English translation.
107. **World Literature, II. 1815-1914.** 4 hours. Second part of a three-course sequence. Covers masterpieces from the Congress of Vienna to World War I. In English and English translation. Prerequisite: Hum. 106.
108. **World Literature, III: 1914 to the Present.** 4 hours. Third part of a three-course sequence. Covers masterpieces from World War I to the present. In English and English translation. Prerequisite: Hum. 106 and 107.
151. **The Heritage of Western Culture, I.** 4 hours. The tragedy of the human condition. Prerequisite: Sophomore standing.
152. **The Heritage of Western Culture, II.** 4 hours. The individual and the state. Prerequisite: Sophomore standing.

153. **The Heritage of World Culture, III.** 4 hours. The conflict between Judaeo-Christian and Greek classical influences on our cultural patterns. Prerequisite: Sophomore standing.
254. **The Bible as Literature.** 4 hours. The literary materials, origins, forms, and interpretations of the principal portions of the Old and New Testaments in English translation. (Same as Engl. 254.)

INFORMATION ENGINEERING

201. **History of Engineering.** 4 hours. The important elements in the growth of the art and science of engineering, from ancient times to the present; lives of some of the leaders; effect of engineering on the social conditions of the various periods. Prerequisite: Junior standing or consent of the instructor.
220. **Basic Electrical Engineering.** 4 hours. Fundamentals of electric and magnetic circuits and characteristics of electron tubes and circuits. Prerequisites: Phys. 113, Math. 133.
229. **Electric and Magnetic Fields.** 4 hours. Elementary electromagnetic field theory for steady and slowly time-varying phenomena as summarized in Maxwell's equations. Prerequisite: Former Phys. 107; credit or registration in former Math. 345.
250. **Linear Network Theory, I.** 4 hours. Together with InfE. 252, the formulation and solution of network equations for sinusoidal and general signals, network theorems, three-phase systems. Prerequisite: Former Phys. 107; credit or registration in InfE. 251.
251. **Circuit Laboratory, I.** 1 hour. Accompanies InfE. 250. Prerequisite: Credit or registration in InfE. 250.
252. **Linear Network Theory, II.** 4 hours. Continues InfE. 250. Prerequisite: InfE. 250, 251; credit or registration in 253.
253. **Circuit Laboratory, II.** 1 hour. Accompanies InfE. 252. Prerequisite: Credit or registration in InfE. 252.
322. **Linear Network Theory, III.** Signal representation in terms of Fourier series; Fourier transforms, and sinusoidal signals in systems analysis for arbitrary wave forms; two-ports and filters as signal processors. Prerequisite: InfE. 252, 253; credit or registration in 323.
323. **Circuit Laboratory, III.** 1 hour. Accompanies InfE. 322. Prerequisite: Credit or registration in InfE. 322.
350. **Lines, Fields, and Waves.** 4 hours. Transmission lines, field calculations, and wave propagation. Prerequisite: InfE. 252, 253, 229; Math. 195; credit or registration in InfE. 351.
351. **Lines, Fields, and Waves Laboratory.** 1 hour. Accompanies InfE. 350. Prerequisite: Credit or registration in InfE. 350.

LATIN

101. **Elementary Latin, I.** 4 hours; seniors, 3 hours. Grammar and reading. For students who have no credit in Latin. A student must have credit in Lat. 102 to receive graduation credit in 101.
102. **Elementary Latin, II.** 4 hours; seniors, 3 hours. Continues Lat. 101. Grammar and reading of easy prose. Prerequisite: Lat. 101 or one year of high school Latin.

103. **Elementary Latin, III. 4 hours.** Review of grammar; reading of prose. Prerequisite: Lat. 102 or two years of high school Latin.
104. **Intermediate Latin, I. 4 hours.** Reading of selections in prose and poetry. Prerequisite: Lat. 103 or two years of high school Latin or equivalent or placement determined by advanced placement test.
105. **Intermediate Latin, II. 4 hours.** Continues Lat. 104. Prerequisite: Lat. 104 or equivalent. Placement may be determined by advanced placement test.
106. **Intermediate Latin, III. 4 hours.** Continues Lat. 105. Prerequisite: Lat. 105 or equivalent. Placement may be determined by advanced placement test.
109. **Honors Course, I. 4 hours.** Rapid reading of Latin prose. Prerequisite: Three or four years of high school Latin with B or better average or advanced placement by examination or consent of the instructor.
110. **Honors Course, II. 4 hours.** Rapid reading of Latin poetry. Prerequisite: Three or four years of high school Latin with B average or better or Lat. 109 or advanced placement by examination or consent of the instructor.
111. **Honors Course, III. 4 hours.** Rapid reading of Latin prose and poetry. Prerequisite: three or four years of high school Latin with B average or better or Lat. 110 or advanced placement by examination or consent of the instructor. Individual assignments at discretion of the instructor.
201. **Survey of Latin Literature, I. 4 hours.** Writings of the early period. Prerequisite: Lat. 106 or equivalent.
202. **Survey of Latin Literature, II. 4 hours.** Writings of the middle period. Prerequisite: Lat. 106 or equivalent.
203. **Survey of Latin Literature, III. 4 hours.** Writings of the late period. Prerequisite: Lat. 106 or equivalent.
211. **Fundamentals of Latin Composition. 4 hours.** Review of grammar and forms; extensive translation from English to Latin.
301. **Corpus Caesarianum. 4 hours.** Rapid reading of Latin prose, based on the *Corpus Caesarianum*, with discussion of the social and political aspects which contribute to understanding of the texts read. Recommended particularly for secondary teachers of Latin.
302. **Vergil. 4 hours.** Rapid reading of Latin poetry, with discussion of meter, diction, mythology, literary tradition, and historic background of the poems. Recommended particularly for secondary teachers of Latin.

MANAGEMENT

150. **Business and Society, I. 3 hours.** Introduction to economic organization. Business organization in its social environment, problems of freedom and order in relation to economic activity; facets of an urban industrial complex and its place in the larger industrial system; impact of this system on society and the influence of society on the system, viewed historically to the present; consideration of the future as shaped by evolving trends. Prerequisite: Enrollment in the College of Business Administration.
151. **Business and Society, II. 3 hours.** Introduction to economic organization, continued. Prerequisite: Mgmt. 150.
152. **Business and Society, III. 3 hours.** Introduction to economic organization, continued. Prerequisite: Mgmt. 151.
350. **Organization and Administration. 3 hours.** The theory of management; concepts of organization; major functions of management; fundamentals of decision making.

Prerequisites: Junior standing; enrollment in the College of Business Administration.

- 351. Organization Theory. 3 hours.** Important theories of organization; their foundation, application, and consequences in the attainment of individual and organization objectives. Prerequisite: Mgmt. 350.
- 352. Production Management. 3 hours.** Production problems in a manufacturing or commercial organization; application of modern techniques of analysis to the solution of production problems of specific cases; decision-making relationships of the production manager and his staff with those of the central staff and other function-area managers and staffs; forecasting plant capacity and location requirements; determination of mix and quantities to produce and translation into production programs; manpower and machine loading; make or buy; inventory management; cost and quality control; innovation; return on investment and other criteria for judging performance. Prerequisites: Senior standing, Mgmt. 351.
- 353. Personnel Management. 3 hours.** The foundation, history, and objectives of personnel management; motivation and supervision; selection, training, and discipline; union-management relations; wage-and-salary administration; personnel research. Prerequisites: Senior standing; Mgmt. 351.
- 359. Business Policy. 4 hours.** The direction of business operations from the top-management point of view rather than from the point of view of a member of an area of particular functional specialization. Determination of problem areas in company operations planning and management in a changing environment. Determination of short-term and long-run plans of action for recommendation to management. Prerequisites: Senior standing; completion of core requirements of the College of Business Administration.

MARKETING

- 260. Principles of Marketing. 4 hours.** Theory and practice in the formulation of marketing decisions. Planning, pricing, and promotion: distribution of goods and services to all types of consumers. Prerequisites: Junior standing; enrollment in the College of Business Administration.
- 361. Consumer Market Behavior. 4 hours.** Motivations underlying market behavior of consumers, producers, middlemen; drives, emotions, desires, learning, memory; effects of demographic characteristics, social status, and reference groups on marketing action. Prerequisite: Mktg. 260.
- 362. Marketing Research. 4 hours.** The gathering and interpretation of information used in solving marketing problems; use of modern research techniques from mathematics and the behavioral sciences in the development of an analytical structure for marketing decision making. Prerequisite: Mktg. 361.
- 363. Marketing Organization. 4 hours.** Principles underlying the development of an integrated distribution system; its relationship to the marketing structure of the firm; evaluation of decisions on raw-material sources, plant and warehouse location, wholesale and retail outlets; analysis of the movement of products through marketing channels. Prerequisite: Mktg. 362.
- 364. Managing Marketing Communications. 4 hours.** Analysis of communication information among producers, middlemen, and consumers for marketing purposes; managerial problems in directing a firm's promotional efforts; personal selling, advertising, sales promotion, public relations. Prerequisite: Mktg. 363.

365. **Marketing Management.** 4 hours. Seminar. Building marketing programs to implement marketing objectives. Individual and group research and presentation from the viewpoint of major marketing executives of a firm; business case analysis. Prerequisite: Mktg. 364.

MATERIALS ENGINEERING

101. **Engineering Mechanics, I.** 3 hours. Statics of particles and rigid bodies. Kinematics and dynamics of particles. Work and energy impulse and momentum. Principles of vibration analysis. Prerequisite: Registration in Math. 132.
102. **Engineering Mechanics, II.** 3 hours. Kinematics and kinetics of rigid bodies, energy and momentum methods. Mechanical vibrations of rigid bodies. Prerequisite: MatE. 101.
103. **Engineering Mechanics, III.** 3 hours. Analysis of stress and strain, principal stresses and strains. Constitutive laws of elastic and selected types of inelastic materials. Strain energy and failure criteria. Simple problems of stress and deformation analysis. Prerequisite: MatE. 102.
111. **Engineering Statics.** 3 hours. Resultants of force systems, algebraic and graphical condition of equilibrium for force systems; moment diagrams, virtual work, forces due to friction; centroids.
112. **Dynamics of Particles.** 3 hours. Kinematics and dynamics of particles. Work and energy, impulse and momentum. Principles of vibration analysis. Prerequisite: MatE. 111.
113. **Dynamics of Rigid Bodies.** 3 hours. Kinematics and kinetics of rigid bodies, energy and momentum methods. Mechanical vibrations of rigid bodies. Prerequisite: MatE. 112.
121. **Elementary Mechanics of Deformable Bodies, I.** 3 hours. Elastic and inelastic relationships between external forces (loads) acting on deformable bodies and the stresses and deformations produced; tension and compression members. Prerequisite: MatE. 111.
122. **Elementary Mechanics of Deformable Bodies, II.** 2 hours. Members subjected to torsion and to bending; buckling (columns); combined stresses; repeated loads (fatigue); energy loads, impact; influence of properties of materials. Prerequisite: MatE. 121.
123. **Mechanical Behavior of Solids.** 1 hour. Influence of loading conditions and environment on the behavior of engineering materials; effects of rate of loading, time, temperature, number of stress cycles, and state of stress on the ductile and brittle behavior of materials; significance of mechanical properties. Prerequisite: Registration in MatE. 122.
124. **Behavior of Materials.** 4 hours. Introduction to atomic and molecular structure of metals, cement, concrete, plastics, ceramics, and glass; response of these materials to rapid, steady, and repeated loads at various temperatures (and environments) in terms of rheological models; fracture behavior of specific materials, i.e., stress rupture, brittle fracture, and fatigue of metals and concrete. Prerequisite: MatE. 122.
125. **Statics.** 3 hours. Resultants and equilibrium of force systems, conditions of equilibrium applied to trusses, frames, and the like, forces due to friction.
126. **Strength of Materials, I.** 3 hours. Centroids, stress and deformation in direct tension and compression, riveted and welded joints, properties of materials. Prerequisite: MatE. 125.

127. **Strength of Materials, II.** 3 hours. Relationships between external forces acting on beams and the stresses produced; shear, moment, slope and deflection diagrams; moment of inertia; columns. Prerequisite: MatE. 126.
131. **Manufacturing Processes.** 4 hours. Foundry practice, pattern design, hot and cold forming. Welding and allied processes, machine tools and machining practice, use of jigs, fixtures, and tools for manufacture of interchangeable parts. Classroom discussion and demonstrations. Prerequisites: SysE. 103, sophomore standing.
132. **Materials Casting.** 4 hours. Casting as a process of fabrication; the molding process, including machine molding; molding sands characteristics, control, and testing. Melting and pouring practice. Physical characteristics of cast materials, advantages and disadvantages; tray iron structures and elementary metallurgical concepts; design of wood and metal patterns and correlation with foundry practice; core requirements control and testing. Prerequisite: SysE. 103, Sophomore standing.
133. **Metal Processing.** 5 hours. Basic machining processes for metal processing. Use of machine tools, jigs, fixtures, gages, and measuring instruments and inspection methods to produce interchangeable metal parts. Prerequisite: SysE. 103, Phys. 112, credit or registration in Math. 133.
134. **Kinematics of Machines and Machine Components.** 4 hours. Linkages, cams, and gears; belts, ropes, and chains; velocities, accelerations, and inertia forces in machines. Prerequisite: MatE. 113.
135. **Dynamics of Machines and Machine Components.** 4 hours. Vibrations and critical speeds; balancing of engines; principle of the gyroscope. Prerequisite: MatE. 134.
141. **Introduction to Civil Engineering.** 1 hour. Informal lectures and discussions, including the position and function of the civil engineer, history of civil engineering, and a qualitative approach to civil engineering problems. Prerequisite: Sophomore standing.
201. **Engineering and Construction Economy.** 5 hours. Application of the mathematics of finance in decision-making on civil engineering works, dyadic formulations with linear programming, cost forecasting. Prerequisite: Credit or registration in Math. 195.
202. **Properties of Soils.** 4 hours. Identification and classification of earth materials, hydraulic and mechanical properties of soils, character of natural soil deposits, appraisal of methods of sub-surface exploration. Laboratory determination of the index properties of soils. Prerequisite: MatE. 122.
203. **Composition and Properties of Concrete.** 3 hours. Properties and uses of cements, aggregates, mixing water, and admixtures; composition and properties of concrete mixtures; field practices in the production of concrete. Laboratory practice in the design and control of quality concrete. Prerequisite: MatE. 123 or 124.
211. **Structural Theory, I.** 3 hours. Introduction to structural analysis; reactions, shears, and moments in statically determinate and indeterminate systems; stresses in trusses and moment-area principles; compatibility equations; slope deflection; moment distribution. Prerequisite: MatE. 122.
212. **Structural Theory, II.** 3 hours. Energy principles in structural analysis; virtual displacements; deflections; strain energy; Castigliano's theory; least work; applications to beams, frames, and trusses. Prerequisite: MatE. 211.
213. **Structural Theory, III.** 3 hours. Design process, influence lines, envelopes of maximum functions. Special sections of this course may be offered for students with a particular background or a specific interest. Prerequisite: MatE. 212.
221. **Behavior and Design of Metal Structures, I.** 3 hours. Design of metal structures; behavior of members and their connections; theoretical, experimental, and

- practical bases for proportioning members. Prerequisite: MatE. 211.
222. **Reinforced Concrete Design, I.** 3 hours. Design of reinforced concrete structures; behavior of beams, columns, and frames; theoretical, experimental, and practical bases for proportioning members. Prerequisite: MatE. 203.
231. **Powder Metallurgy.** 3 hours. Characteristics of parts produced from powdered metals and alloys. Powder production techniques, particle size distribution, pressing and sintering theory. Hot pressing. Economics of production. Prerequisite: MatE. 122.
233. **Principles of the Properties of Materials, I.** 3 hours. First of a three-course sequence. Phase diagrams, equilibrium and nonequilibrium conditions, properties of metals and alloys related to structure, elementary physics of metals, composition, structure, and heat treatment of iron, steel, and ferrous alloys. Prerequisite: MatE. 122.
234. **Principles of the Properties of Materials, II.** 3 hours. Second of a three-course sequence. Phase diagrams, equilibrium and nonequilibrium conditions, properties of metals and alloys related to structure, elementary physics of metals, composition, structure, and heat treatment of iron, steel, and ferrous alloys. Prerequisite: MatE. 233.
235. **Principles of the Properties of Materials, III.** 3 hours. Third of a three-course sequence. Phase diagrams, equilibrium and nonequilibrium conditions, properties of metals and alloys related to structure, elementary physics of metals, composition, structure, and heat treatment of iron, steel, and ferrous alloys. Prerequisite: MatE. 234.
236. **Materials Engineering Laboratory, I.** 1 hour. Part I of a three-course sequence. Demonstration of principles of solidification, cold working, annealing and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography—analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 233.
237. **Materials Engineering Laboratory, II.** 1 hour. Part II of a three-course sequence. Demonstration of principles of solidification, cold working, annealing and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography—analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 234.
238. **Materials Engineering Laboratory, III.** 1 hour. Part III of a three-course sequence. Demonstration of principles of solidification, cold working, annealing and heat treatment of metals. Study of microstructures of simple binary alloys. Principles and techniques of metallography and photomicrography—analysis and interpretation of microstructures. Prerequisite: Registration in MatE. 235.
239. **X-Ray Metallography, I.** 3 hours. Part I of a two-course sequence. X-ray generation and scattering. Applications of methods of X-ray diffraction to studies of crystallography and problems in physical metallurgy, such as phase identification, lattice parameter determination, grain size determination, preferred orientation, surface topography and residual stress determination. Prerequisite: MatE. 233.
240. **X-Ray Metallography, II.** 3 hours. Part II of a two-course sequence. X-ray generation and scattering. Applications of methods of X-ray diffraction to studies of crystallography and problems in physical metallurgy, such as phase identification, lattice parameter determination, grain size determination, preferred orientation, surface topography and residual stress determination. Prerequisite: MatE. 239.

MATHEMATICS

100. **Algebra and Trigonometry, I. 5 hours.** Credit is not given for 100 if student has credit in 104 or 105. Fundamentals of algebra, factoring, fractions, radicals, exponents, solutions of equations, complex numbers, logarithms, progressions. Prerequisite: 1 unit of entrance credit in algebra and in plane geometry.
101. **Algebra and Trigonometry, II. 5 hours.** Credit is not given for 101 if student has credit in 104 or 105. Mathematical induction, binomial theorem, inequalities, theory of equations, determinants, permutations and combinations, trigonometric functions, identities, equations, graphs. Prerequisite: Math. 100.
104. **College Algebra. 5 hours.** Credit is not given for 104 if student has credit in 100 or 101. Theory of equations, systems of equations, determinants, complex numbers, permutations and combinations, probability, mathematical induction, binomial theorem, progressions, inequalities, logarithms. Prerequisite: 1 1/2 units of entrance credit in algebra and 1 unit in plane geometry.
105. **Trigonometry. 3 hours.** Restricted to students who have not had a formal course in trigonometry. Credit is not given for 105 if student has credit in 101. Identities, equations, addition formulas and derived relations, solution of triangles, radian measure, graphs, inverse functions. Prerequisite: 1 1/2 units of entrance credit in algebra and 1 unit in plane geometry.
110. **Finite Mathematics. 5 hours.** Statements and logic, sets, Boolean algebra, probability, vectors and matrices, linear programming, theory of games. Prerequisite: Math. 101 or 104.
111. **Introduction to Analysis, I. 3 hours.** Introduction to differential and integral calculus, together with sufficient material from analytic geometry to assist in the development and application of the calculus. For students in business administration or architecture; others by consent of department. Prerequisite: Math. 101 or 104.
112. **Introduction to Analysis, II. 3 hours.** Continues Math. 111. For students in Business Administration and Architecture; others, by consent of the department. Prerequisite: Math. 111.
115. **Fundamentals of Mathematics, I. 4 hours.** Numbers and numerals, algebra, progressions, number theory. Prerequisite: 1 unit in algebra and in plane geometry.
116. **Fundamentals of Mathematics, II. 4 hours.** Axioms of euclidean geometry, symmetry, perspective, Cartesian geometry, conic sections, noneuclidean geometry. Prerequisite: Math. 115 or consent of the department.
117. **Fundamentals of Mathematics, III. 4 hours.** Survey course. Sets and logic, infinity, probability, statistics, calculus, computing machines. Prerequisite: Math. 116.
130. **Analytic Geometry, Linear Algebra, and Calculus, I. 5 hours.** Vector spaces, geometrical properties of curves and surfaces, transformations and matrices. Prerequisite: Math. 101, or 104 and 105; or equivalent.
131. **Analytic Geometry, Linear Algebra, and Calculus, II. 5 hours.** Coordinate systems, higher plane curves, parametric equations, limits, differentiation and integration of algebraic and trigonometric functions, applications. Prerequisite: Math. 130.
132. **Analytic Geometry, Linear Algebra, and Calculus, III. 5 hours.** Additional topics in differentiation and integration. The definite integral; applications, methods of integration. Prerequisite: Math. 131.
133. **Analytic Geometry, Linear Algebra, and Calculus, IV. 5 hours.** Other methods

- of integration, hyperbolic functions, partial differentiation, multiple integrals, infinite series, expansion of functions. Prerequisite: Math. 132.
194. **Introduction to Automatic Digital Computing for Nontechnical Studies. 3 hours.** Credit is not given for both 194 and 195. Restricted to students not in mathematics, physics, engineering, or related curricula. Topics in problem formulation, logical statement of problems, automatic programming, applications to computers. IBM 1620 is used. Prerequisite: Sophomore standing or consent of the instructor.
 195. **Introduction to Automatic Digital Computing. 3 hours.** Credit is not given for both 195 and 194. Topics in machine organization, problem formulation, automatic programming, numerical analysis, machine language programming, and applications. The IBM 1620 is used for solving problems. Prerequisite: Math. 132.
 220. **Elementary Differential Equations. 3 hours.** Ordinary differential equations and their applications to physical problems. First and second order equations; operator methods in linear equations. Prerequisite: Math. 132.
 250. **Statistics for Engineers. 5 hours.** A first course in the use of statistical methods for interpreting the results of experiments. Probability and distributions, expectation, sampling and testing, estimation problems, chi square tests, T and F tests, regression and correlation. Prerequisite: Math. 133.
 290. **Introduction to the Theory of Digital Machines. 3 hours.** The general organization of computers, number systems, Boolean algebra, design of combinational circuits, and sequencing of arithmetic operations. Prerequisite: Math. 195.
 300. **Teachers Course, I. 3 hours.** Some of the important mathematical concepts and the problems involved in teaching them. Numeration systems, set relations, functions, the whole numbers, logic and proof. Some of the major new curricula are examined. Prerequisite: Math. 133 or consent of instructor.
 301. **Teachers Course, II. 3 hours.** Rational number systems; exponential, logarithmic, and trigonometric functions, and theory of equations. Examination of the treatment of some of these concepts in the major new curricula. Prerequisite: Math. 300.
 302. **Teachers Course, III. 3 hours.** Complex numbers, systems of equations, permutations, statistics and probability. Effectiveness of the new curricula; problems encountered in teaching them. Prerequisite: Math. 301.
 303. **Advanced Euclidean Geometry, I. 3 hours.** Geometry from Euclid to the present, equivalents of Euclid's fifth postulate, noneuclidean geometries, finite and projective geometries, invariants of configurations under transformation. Prerequisite: Math. 133.
 304. **Advanced Euclidean Geometry, II. 3 hours.** Projective geometry, cross ratio, theorems of Desargue, Pascal, and Pappus; analytic projective geometry, advanced problems in euclidean geometry, circumcircle, nine-point circle, orthocenter, use of analysis in geometric problems. Prerequisite: Math. 303.
 305. **Advanced Euclidean Geometry, III. 3 hours.** Construction problems, relation of regular polygons to the roots of unity, isometries in the plane and space, rotation, translation, reflection, fixed points, ordered and affine geometry, synthetic vector geometry. Prerequisite: Math. 304.
 307. **Theory of Sets and the Real Number System. 5 hours.** The elementary naive set theory and the development of the integers, the rational numbers, and the real numbers. Prerequisite: Math. 133.
 310. **Higher Analysis, I. 4 hours.** The number system, functions, sequences and limits, continuity and differentiability, integration, the elementary transcendental functions, limits and continuity, properties of differentiable functions. Individual projects and reading are assigned. Prerequisites: Math. 133.

311. **Higher Analysis, II. 3 hours.** Vectors and curves, functions of several variables, limits and continuity, differentiable functions, transformations and implicit functions, extreme values, multiple integrals, line and surface integrals. Prerequisite: Math. 310.
312. **Higher Analysis, III. 3 hours.** Infinite series, sequences and series of functions, uniform convergence, the Taylor series, improper integrals, integral representation of functions, Fourier series. Prerequisite: Math. 311.
321. **Differential Equations, I. 3 hours.** Series solutions of differential equations, orthogonal functions, Fourier series methods and applications to physical problems. Existence and convergence theorems of differential equations. Prerequisite: Math. 310 or consent of the department.
322. **Differential Equations, II. 3 hours.** Introduction to partial differential equations, separation of variables, linear equations, special equations of higher order, including elliptic, parabolic, and hyperbolic equations of second order; geometric and physical applications. Prerequisite: Math. 321 or consent of the department.
323. **Differential Equations, III. 3 hours.** Boundary value problems, Fourier series, orthogonal functions, Fourier integrals, Bessel functions; applications to physical problems. Prerequisite: Math. 322.
330. **Complex Variables for Engineering and Applied Mathematics, I. 3 hours.** Credit not given for 330 if student has credit in 332 or 333. Complex numbers and their geometrical representation, point sets of complex numbers, analytic functions, elementary functions, integration, power series, Taylor and Laurent expansions, the calculus of residues. Prerequisite: Math. 311.
331. **Complex Variables for Engineering and Applied Mathematics, II. 3 hours.** Credit not given for 331 if student has credit in 332 or 333. Properties of mappings, the calculus of residues and loop integration, conformal representation; application of analytic functions to the theory of flow, potential and other related fields. Prerequisite: Math. 330.
332. **Complex Variables, I. 3 hours.** Credit not given for 332 if student has credit in 330 or 331. Power series in one variables, holomorphic functions, Cauchy's integral, Taylor and Laurent expansions. Prerequisite: Math. 312.
333. **Complex Variables, II. 3 hours.** Credit not given for 333 if student has credit in 330 or 331. Analytic functions of several complex variables, harmonic functions, convergence of sequences of holomorphic functions, infinite products, normal families, holomorphic transformations, holomorphic systems of differential equations. Prerequisite: Math. 332.
340. **Modern Higher Algebra, I. 3 hours.** Sets and real numbers, groups, rings. Prerequisite: Math. 133.
341. **Modern Higher Algebra, II. 3 hours.** Integral domains, fields, linear algebra, vector spaces, basis, dimension, linear transformations. Prerequisite: Math. 340.
342. **Modern Higher Algebra, III. 3 hours.** Matrices, duality, inner product spaces, bilinear and quadratic forms. Prerequisite: Math. 341.
343. **Formal Logic, I. 4 hours.** Same as Phil. 343. Propositional and restricted predicate calculi. Prerequisites: Mathematics majors, none; others, Phil. 211 and two courses in mathematics or consent of the instructor.
344. **Formal Logic, II. 4 hours.** Same as Phil. 344. Continues Math. 343. Validity, probability, consistency, completeness. Prerequisite: Math. 343.
348. **Linear Transformations and Matrices. 5 hours.** Matrix algebra, determinants, inverses of matrices, rank and equivalence, linear independence, vector spaces and linear transformation, unitary and orthogonal transformations, characteristic equation of a matrix. Prerequisite: Math. 133.

350. **Introduction to Higher Geometry, I.** 3 hours. Projective properties in the euclidean plane, extending the euclidean plane, the projective plane, axioms for the projective plane, conics, introduction of coordinates. Prerequisite: Math. 342.
351. **Introduction to Higher Geometry, II.** 3 hours. Topics in geometry, projective planes, higher dimensional projective geometries, model as subspaces of a vector space, coordinatization. Prerequisite: Math. 350.
352. **Introduction to Higher Geometry, III.** 3 hours. Introduction to differential geometry, curves, surfaces, manifolds imbedded in euclidean space, Riemannian geometry, first and second fundamental forms of imbedded surfaces. Prerequisite: Math. 351 and 310.
355. **Introduction to Topology, I.** 3 hours. Topological spaces, separation axioms, compactness, connectedness, product spaces, identification spaces, adjunction spaces. Prerequisite: Math. 310.
356. **Introduction to Topology, II.** 3 hours. Cells and simplexes, the Brauer fixed point theorem, polyhedra, introduction to dimension, classification of surfaces. Prerequisite: Math. 342 and 355.
357. **Introduction to Topology, III.** 3 hours. The homology and cohomology theories on polyhedra, the invariance of homology and cohomology, the axioms, the fundamental group. Prerequisite: Math. 356 and 341.
360. **Theory of Numbers, I.** 3 hours. Elementary theory of numbers, divisibility, primes, congruences, multiplicative groups, rings and fields, quadratic residues. Prerequisite: Math. 133.
361. **Theory of Numbers, II.** 3 hours. Functions of number theory, recurrence functions, diophantine equations, quadratic forms, Farey sequences and rational approximations. Prerequisite: Math. 360 or consent of the instructor.
362. **Theory of Numbers, III.** 3 hours. Continued fractions, distribution of primes, algebraic numbers, polynomials, partitions, density of sequences of integers. Prerequisite: Math. 361 or consent of the instructor.
370. **Statistics, I.** 3 hours. Probability models, univariate distributions, random variables. Prerequisite: Math. 133.
371. **Statistics, II.** 3 hours. Statistical problems and procedures, estimation, testing hypotheses, distribution theory. Prerequisite: Math. 370.
372. **Statistics, III.** 3 hours. One-sample problems, comparison, linear models and analysis of variance. Prerequisite: Math. 371.
374. **Probability, I.** 3 hours. Sample spaces; combinatorial probability; conditional probability and independence; binomial, Poisson and normal distributions. Prerequisite: Math. 133.
375. **Probability, II.** 3 hours. Law of large numbers, central limit theorem, random variables, recurrent events, random walks, Markov chains. Prerequisite: Math. 374.
377. **Finite Differences, I.** 3 hours. Difference formulas, finite integration, summation of series, Bernoulli and Euler polynomials, interpolation. Prerequisite: Math. 133.
378. **Finite Differences, II.** 3 hours. Approximate integration, beta and gamma functions, difference equations. Prerequisite: Math. 377.
381. **Vector and Tensor Analysis, I.** 3 hours. Algebra of vectors, vector differential calculus, differential geometry, Stokes' theorem, divergence theorem; application to electricity, mechanics, hydrodynamics and elasticity. Prerequisite: Math. 311 or consent of instructor.
382. **Vector and Tensor Analysis, II.** 3 hours. Algebra of vectors, vector and scalar multiplication, tensor, covariance, contravariance, geodesics, covariant differentiation, curvature tensor and interpretation, the Ricci and Einstein tensor, Dieman-

nian curvature, flat space, Cartesian tensors, physical components of tensors, dynamics of a particle and of a rigid body, general dynamical systems. Prerequisites: Math. 381 or 311.

385. **Laplace's Transforms. 5 hours.** The Laplace transform and its inverse, properties of the transform, linear differential equations (ordinary and partial), linear difference equations, gamma, error and Bessel functions, asymptotic series, non-elementary integrals, integral equations, Hankel transforms. Prerequisite: Math. 311.
387. **Numerical Methods, I. 3 hours.** An introduction to numerical analysis and applications to computers. Determinants, solution of linear systems of equations, polynomial interpolation, remainder theory. Prerequisite: Math. 195, 312.
388. **Numerical Methods, II. 3 hours.** A continuing study of numerical analysis and applications to computers. Convergence theorems for interpolatory processes, uniform approximation, best approximation, least square approximation. Prerequisite: Math. 387.
389. **Numerical Methods, III. 3 hours.** A third course in the study of numerical analysis and applications to computers. Iterative methods for the solution of equations, iteration functions, the mathematics of difference relations. Prerequisite: Math. 388.
391. **Boolean Algebra with Applications to Computer Circuits, I. 3 hours.** Same as InfE. 391. An introduction to Boolean algebra; discussion of the elementary application to set theory, logic and relay and electronic switching circuits. Prerequisite: Math. 290.
392. **Boolean Algebra with Application to Computer Circuits, II. 3 hours.** Same as InfE. 392. The Howard chart method and other methods for circuit simplification as applied to single output and multiple output circuits. The notion of time as a parameter is introduced into the theoretical treatment of switching circuits. Prerequisite: Math. 391.
393. **Boolean Algebra with Applications to Computer Circuits, III. 3 hours.** Synthesis of time-dependent circuits, transition circuits, asynchronous circuit theory. Prerequisite: Math. 392.
394. **Logical Design of Automatic Digital Computer Circuits. 5 hours.** Logical structure of components of a digital computer and the interrelations necessary for automatic operation. Binary and decimal fixed-point arithmetic, floating-point arithmetic, controls, error detection. Prerequisite: Math. 290 and senior standing, or consent of the instructor.
395. **Advanced Programming. 3 hours.** The efficient use of computers for solving problems; examples in which limitations of computers have been overcome. Prerequisite: Math. 290 and senior standing, or consent of the instructor.
397. **Mathematical Theory of Data Processing. 3 hours.** Development of mathematical structure and automatic processing of extensive data files, using methods from statistics, graph theory, and information theory. Selective screening and classification of data: pattern recognition, machine abstracting, optimum encoding, least-square adjustment of data. File organization and maintenance: information retrieval, indexing, scheduling. Prerequisite: Math. 195 or 290 or consent of the instructor.
399. **Honors in Mathematics. 3 hours.** May be repeated for credit. Seminars in special topics and advanced problems for students majoring in mathematics. Independent study under the guidance of senior members of the staff. Prerequisite: Math. 312 and 342 or consent of the instructor.

MILITARY SCIENCE

- 101. First Year Basic. 1 hour.** The organization of the U. S. Army from squad to battalion level; principles of military organization; responsibilities of key personnel. History, purpose, and objective of the R.O.T.C.; scope of training. Role of the Army in implementing U. S. national defense policy. Laboratory, covering organization, leadership, command and drill. Prerequisites: Military Department approval; enrollment in appropriate non-military academic course.
- 102. First Year Basic. 1 hour.** The problems of United States national defense policy; the role of the Army in the implementation of that policy. Laboratory, covering organization, leadership, command and drill. Prerequisite: MilS. 101 or Military Department approval; enrollment in appropriate nonmilitary academic course.
- 103. First Year Basic. 1 hour.** The evolution of military firearms; assembly, disassembly, and mechanical functioning of basic individual arms. Fundamentals of marksmanship. Continues laboratory instruction in organization, leadership, command, and drill. Prerequisite: Military Department approval; enrollment in appropriate nonmilitary academic course.
- 111. Second Year Basic. 3 hours.** American military history from its origin to date; counterinsurgency; laboratory instruction in organization, leadership, command, and drill. Prerequisite: Approval of the professor of military science, MilS. 101, 102, 103 or equivalent.
- 112. Second Year Basic. 2 hours.** Map and aerial-photograph analysis; introduction to tactics. Laboratory, covering organization, leadership, command, and drill. Prerequisite: Approval of the professor of military science; MilS. 101, 102, 103 or equivalent.
- 113. Second Year Basic. 1 hour.** Fundamentals and principles of tactics; laboratory, covering organization, leadership, command, and drill. Prerequisite: Approval of the professor of military science; MilS. 101, 102, 103, and 112 or equivalent.
- 201. First Year Advanced. 3 hours.** Presentation of the branches of the Army with emphasis on their assigned special missions; principles of leadership, nature and causes of insurgency and the concept of counterinsurgency. Leadership laboratory, accentuating officer leadership responsibilities. Prerequisite: Approval of the professor of military science; MilS. 100 series or equivalent; registration in appropriate nonmilitary academic course.
- 202. First Year Advanced. 3 hours.** Techniques of military teaching methods, stressing the learning process and leadership characteristics. Small-unit tactics and communication. Leadership laboratory, accentuating officer leadership responsibilities. Prerequisites: Approval of the professor of military science; MilS. 100 series or equivalent.
- 203. First Year Advanced. 2 hours.** The development of current tactical doctrine and communications. The impact of modern weapons and materiel. Leadership laboratory. Prerequisites: Approval of the professor of military science; MilS. 100 series or equivalent; registration in appropriate nonmilitary academic course.

MUSIC

- 100. Rudiments of Theory. 3 hours.** Notation, key signatures, scales, intervals, triads, metrical organization and rhythmic structure, dictation, and sight singing.

For nonmusic students or music students not qualified to enter Mus. 101.

101. **Theory of Music.** 3 hours. Concurrent enrollment in 107 is required. Introduction to harmony, melodic analysis, and related keyboard drill. Prerequisite: Mus. 100 or equivalent.
107. **Ear Training.** 1 hour. Concurrent enrollment in 101 is required. The development of aural perception and sight singing skills. Prerequisite: Enrollment in Mus. 101.
130. **Introduction to the Art of Music.** 3 hours. Primarily for the layman. Intelligent listening; acquaintance with the stylistic and formal characteristics of important works of music literature.
151. **Band.** ½ hour. Participation in instrumental ensemble; application of band literature. Prerequisite: Student must pass an audition.
152. **Orchestra.** ½ hour. Instrumental ensemble; performance of important instrumental literature of varied types. Prerequisite: Student must pass an audition.
153. **Choir.** ½ hour. Introduction to important choral literature of all periods. Regular performances are scheduled throughout the school year. Prerequisite: Student must pass an audition.
170. **Class Piano. Noncredit.** Basic practical needs for music majors and minors who have little or no keyboard background. Students who pass the piano proficiency examination are exempt from this course.
171. **Class Piano, II. Noncredit.** Continues Mus. 170. Prerequisite: Mus. 170 or consent of the instructor.
172. **Class Piano, III. Noncredit.** Continues Mus. 171. Prerequisite: Mus. 171 or consent of the instructor.
200. **Music in the Middle Ages and the Renaissance.** 3 hours. A history of music from about 1000 to 1600; some preliminary study related to music in ancient times. Prerequisite: Music major or minor or consent of the instructor.

PHILOSOPHY

101. **Introduction to Philosophy.** 4 hours. An introduction to some of the more significant problems which arise in such philosophical disciplines as metaphysics, the theory of knowledge, and the philosophies of religion, science, and history. Individual conferences on assigned papers are required. Prerequisite: Second quarter freshman standing.
102. **Elementary Logic.** 4 hours. Clarity and validity in argument; detection of fallacies; introduction to the use of symbolism in constructing proofs. Prerequisite: Second-quarter freshman standing.
103. **Introduction to Ethics.** 4 hours. Representative classical and modern ethical philosophies; their assumptions as to the nature of man and their import for social and political thought. Individual conferences on assigned papers are required. Prerequisite: Second-quarter freshman standing.
201. **Ancient Philosophy.** 4 hours. The development of Greek and Roman philosophy. Prerequisite: Junior standing or two courses in philosophy.
202. **Medieval Philosophy.** 4 hours. Reading and discussion of selected philosophical works from St. Augustine through William of Ockham. Prerequisite: Two courses in philosophy.
203. **History of Modern Philosophy.** 4 hours. The development of Western philosophy from Descartes through Kant. Prerequisite: Junior standing or two courses in philosophy.

206. **American Philosophy.** 4 hours. Main currents of philosophical thought in America. Prerequisite: One course in philosophy.
211. **Introduction to Formal Logic.** 4 hours. Elementary theory and methods of symbolic logic. Prerequisite: Phil. 102 or one course in mathematics.
212. **Philosophy of Art.** 4 hours. Various philosophical approaches to the problem of the nature and function of art; standards of evaluation and criticism in art.
214. **Philosophy of Religion.** 4 hours. Philosophical inquiry into the grounds of religious belief. The character of religious experience. Prerequisite: One course in philosophy.
216. **Political and Social Philosophy.** 4 hours. Philosophical bases of social and political institutions and practices. The nature of the state; justice and law; rights and natural rights; social utility and public interest. Prerequisite: One course in philosophy.
222. **Introduction to the Philosophy of Science.** 4 hours. The nature of scientific explanation and verification. The status of scientific theories; induction and probable inference. Special problems of the behavioral and social sciences.
231. **Seminar.** 4 hours. May be taken twice. Selected topics. Students prepare short, original research papers for critical analysis and evaluation. Prerequisite: Junior or senior standing; major in philosophy; overall 4.0 average or consent of the department.
301. **Plato.** 4 hours. Selected dialogues. Prerequisite: Two courses in philosophy.
302. **Aristotle.** 4 hours. Reading and discussion of some of the basic works. Prerequisite: Two courses in philosophy.
304. **Seventeenth Century Rationalism.** 4 hours. Selected readings and discussion from the works of Descartes, Spinoza, and Leibniz. Prerequisite: Two courses in philosophy.
306. **British Empiricism.** 4 hours. Selected readings from the works of such philosophers as Locke, Berkeley, and Hume. Prerequisite: Two courses in philosophy.
308. **Kant.** 4 hours. Kant's philosophy, with emphasis on the *Critique of Pure Reason*. Prerequisite: Two courses in philosophy.
310. **Nineteenth Century Thought.** 4 hours. Studies of selections from the writings of Hegel, Schopenhauer, Marx and Engels, J. S. Mill, Nietzsche, and others. Prerequisite: Two courses in philosophy.
312. **Recent and Contemporary Philosophy: Analysis and Logical Empiricism.** 4 hours. Developments in recent philosophy which have their roots in the study of logic and language, such as logical atomism, positivism, and analytical philosophy. Prerequisite: Two courses in philosophy; 211 recommended.
314. **Recent and Contemporary Philosophy: Phenomenology and Existentialism.** 4 hours. Recent developments in phenomenology and in the philosophy of personal existence. Selected readings from Kierkegaard, Husserl, Jaspers, Heidegger, Sartre, and others. Prerequisite: Two courses in philosophy.
330. **Theory of Knowledge.** 4 hours. The grounds of belief; the nature of truth; evidence and proof; other related epistemological problems. Prerequisite: Two courses in philosophy.
332. **Ethics and Value Theory.** 4 hours. The nature of moral judgments and moral reasoning; ethics as a normative discipline; definition of "value"; ethical judgments as a kind of value judgment. Prerequisite: Two courses in philosophy.
336. **Topics in Metaphysics.** 4 hours. Selected metaphysical concepts such as existence, substance and attribute, universals and particulars, change, identity, space and time, the individual. Recent as well as traditional points of view are considered. Prerequisite: Two courses in philosophy.
338. **Philosophical Analysis of the Concept of Mind.** 4 hours. Presuppositions and

logical interconnections involved in the use of such terms as "mind," "thought," "action," "intention," and "will." Prerequisite: Two courses in philosophy.

340. **Philosophy of Language.** 4 hours. Meaning, psychology, and structure of language as exemplified in such thinkers as Frege, Church, Quine, and Wittgenstein. Prerequisite: Phil. 211 or 343 or some demonstration of familiarity with the techniques of symbolic logic and consent of the instructor.
343. **Formal Logic, I.** 4 hours. Same as Math. 343. Propositional and restricted predicate calculi. Prerequisites: Mathematics majors, none; others, Phil. 211 and two courses in mathematics or consent of the instructor.
344. **Formal Logic, II.** 4 hours. Same as Math. 344. Continues Math. 343. Validity, provability, consistency, completeness. Prerequisite: Math. 343.

PHYSICAL EDUCATION FOR MEN

- 101, 102, 103, 104. **Prescribed Exercises.** 1 hour. May be repeated for up to 4 hours of credit. Open only to students who are assigned by the Health Service. Prescribed exercises adapted to individual needs, capacities, and interest.
106. **Developmental Activities.** 1 hour. Development and maintenance of physical fitness according to social and hygienic standards.
107. **Beginning Swimming.** 1 hour. Prerequisite: Inability to swim.
108. **Intermediate Swimming and Water Polo.** 1 hour. Improves swimming skills of those who swim inefficiently but are beyond the beginner's level; develops skills necessary to play water polo reasonably well. Prerequisite: Ability to swim 50 yards.
109. **Advanced Swimming and Diving.** 1 hour. Development of skill in competitive swimming strokes and diving. Prerequisite: Ability to swim 200 yards.
110. **Life Saving and Skin Diving.** 1 hour. The American Red Cross Senior Life Saving Certificate is awarded upon successful completion of the course. Prerequisite: Ability to swim the back, breast, crawl, and side strokes 100 yards each.
112. **Individual Tumbling Stunts.** 1 hour.
113. **Double Tumbling Stunts.** 1 hour.
114. **Apparatus Stunts.** 1 hour.
115. **Circus stunts.** 1 hour.
117. **Boxing.** 1 hour.
118. **Wrestling.** 1 hour.
119. **Foil Fencing.** 1 hour.
120. **Personal Defense Activities.** 1 hour.
121. **Weight Training.** 1 hour. For the individual who is underweight or overweight and lacks strength. Prerequisite: Recommendation of staff.
122. **Individual Athletics.** 1 hour.
123. **Weight Lifting.** 1 hour.
124. **Track and Field Athletics.** 1 hour.
125. **Flickerball.** 1 hour.
126. **Touch Football.** 1 hour.
127. **Softball.** 1 hour.
128. **Soccer.** 1 hour.
129. **Volleyball.** 1 hour.
130. **Basketball.** 1 hour.
131. **Speedball.** 1 hour.
132. **Archery.** 1 hour.

133. Squash Racquets. 1 hour.
134. Handball. 1 hour.
135. Tennis. 1 hour.
136. Badminton. 1 hour.
137. Bowling. 1 hour.
138. Golf. 1 hour.
139. Backyard Sports. 1 hour.
140. Boating and Fishing. 1 hour.
142. Ballroom Dance. 1 hour.
143. American Square Dance. 1 hour. Same as PEW 143.
170. Fundamentals of Baseball. 4 hours.
171. Fundamentals of Basketball. 4 hours.
173. Fundamentals of Gymnastics. 2 hours.
174. Fundamentals of Swimming. 4 hours. Prerequisite: Student must pass a swimming test.
175. Fundamentals of Track and Field Athletics. 4 hours.
176. Wrestling and Defense Activities. 4 hours.
177. Fundamentals of Special Activities. 2 hours. Field sports and bowling.
178. Fundamentals of Special Activities. 2 hours. Badminton, volleyball, and tennis.
179. Fundamentals of Special Activities. 2 hours. Handball, archery, and golf.
180. Fitness Programs. 4 hours. Basic skills, knowledges, and concepts.
185. Introduction to Physical Education. 3 hours. Physical education, athletics, health, safety, recreation. For physical education majors.
188. History of Sports. 4 hours. Development of sports and physical education in Europe and the United States since 1750. For physical education majors only.
190. Principles of Recreation. 4 hours. History of leisure and recreation; concepts of play and recreation; major recreation agencies.
191. Camp Counseling. 4 hours. Objectives, administration, techniques, activity programs, evaluation.

PHYSICAL EDUCATION FOR WOMEN

100. Conditioning Activities. 1 hour.
102. Modified Activities. 1 hour.
105. Elementary Rhythms. 1 hour.
106. Intermediate Rhythms. 1 hour.
110. Elementary Swimming. 1 hour.
111. Sub-Intermediate Swimming. 1 hour.
112. Intermediate Swimming. 1 hour.
123. Basketball. 1 hour.
124. Volley Ball. 1 hour.
125. Soft Ball. 1 hour.
130. Badminton. 1 hour.
132. Bowling. 1 hour.
136. Tennis. 1 hour.
138. Track and Field. 1 hour.
141. Stunts and Tumbling. 1 hour.
143. American Square Dancing. 1 hour. Same as PEM 143.
144. Folk Dancing. 1 hour.
150. Professional Orientation. 3 hours. ♦
151. Body Mechanics and Basic Movement. 1 hour.

152. Soccer and Speedball. 1 hour. Techniques and rules. Concentration on teaching and refereeing.
153. Stunts, Tumbling, and Trampoline. 1 hour.
154. Volley Ball, Track and Field. 1 hour.
155. Gynastics and Apparatus, I. 1 hour.
156. Swimming, II. 1 hour. Advanced Swimming. Techniques of diving, synchronized swimming, and elementary competitive forms.
157. Basketball, I and Soft Ball. 1 hour.
159. Basketball, II, and Field Hockey. 1 hour.
166. Games in the Elementary School. 3 hours.
168. Gymnastics and Apparatus, II. 1 hour.

PHYSICAL SCIENCES

101. Physical Science. 4 hours. Together with 102 and 103, an introduction to the principles of the physical sciences, including astronomy, physics, chemistry, and geology. May be followed by either PSci. 102 or 103.
- 102 Physical Science. 4 hours. Continues PSci. 101. Prerequisite: PSci. 101.
103. Physical Science. 4 hours. Continues PSci. 102. Prerequisite: PSci. 101.

PHYSICS

101. Mechanics. 5 hours. Statics, dynamics, energy, work, momentum, and the conservation laws. Prerequisite: Trigonometry.
102. Heat, Sound, and Light. 5 hours. Mechanical and electromagnetic waves. Prerequisite: Phys. 101.
103. Electricity, Magnetism, and Modern Physics. 5 hours. Electric fields and potential, elementary electric currents, magnetic fields, elementary atomic theory and nuclear physics. Prerequisite: Phys. 102.
111. Mechanics. 4 hours. Kinematics and dynamics of particles, momentum, and energy; conservation laws; special relativity. Prerequisite: Credit or registration in Math. 131.
112. Fluid Mechanics, Sound, Heat. 5 hours. Properties of fluids, laws of thermodynamics, vibrational motion. Prerequisite: Phys. 111; credit or registration in Math. 132.
113. Electricity and Magnetism. 5 hours. Electric fields and potential, capacitance and inductance, elementary DC and AC circuits, magnetic fields, and electromagnetic induction. Prerequisite: Phys. 112.
114. Light and Modern Physics. 5 hours. Geometrical and wave optics, electromagnetic radiation, elementary atomic theory, nuclear physics. Prerequisite: Phys. 113.
301. Electricity and Magnetism, I. 4 hours. Applications of and problems in circuit theorems, electric fields, capacitance, energy and forces associated with these fields in free space and in matter. Prerequisite: Credit or registration in Math. 321 and Phys. 114.
302. Electricity and Magnetism, II. 4 hours. Applications of and problems in circuit theorems, magnetic fields, inductance, energy and forces associated with these fields, in free space and matter, electromagnetic induction, and Maxwell's equations. Prerequisite: Phys. 301.

303. **Electricity and Magnetism, III.** 4 hours. Effects associated with changing fields and currents, transients, coupled circuits, filters, transmission lines, electromagnetic waves, circuit theorems in transient and steady state analysis. Prerequisite: Phys. 302.
304. **Electronics, I.** 4 hours. Theory of electronic devices, linear and nonlinear analysis, applications of vacuum and semiconductor devices to circuits, amplifiers, biasing, feedback, oscillators, and special circuits. Prerequisite: Phys. 301. Phys. 302 and 303 are recommended.
305. **Electronics, II.** 4 hours. Pulse-shaping networks, logic circuits, control circuits, distributed amplifiers, special problems of transducers, special signal-to-noise techniques. Prerequisite: Phys. 304.
321. **Atomic Physics.** 3 hours. The properties of free electrons and ions, photons and their interaction with matter, atomic spectra and structure; introduction to quantum mechanics. Prerequisite: Phys. 114. Credit or registration in Math. 321 recommended.
322. **Atomic and Molecular Physics.** 3 hours. Diatomic molecules: vibrational spectra, potential energy curves, chemical bonding, band structure. Polyatomic molecules: Raman, infrared, rotational, and microwave spectra, force fields and chemical bonding. Prerequisite: Phys. 321.
323. **Solid State Physics.** 3 hours. Crystal structure, thermal and dielectric properties of solids, free electron model of metals, band theory, semiconductor physics, dislocations and strength of solids. Prerequisite: Phys. 322.
331. **Nuclear Physics.** 3 hours. Natural and artificial radioactivity, equipment for studying and producing high energy particles, nuclear disintegrations, interaction of nuclear particles with each other and with matter, cosmic rays, mesons; recent developments in high energy physics. Prerequisite: Phys. 321.
341. **Theoretical Mechanics, I.** 3 hours. Motion of a particle in one, two, and three dimensions; Kepler's laws and planetary motion; scattering of particles; conservation laws; motion of a rigid body in two dimensions; statics of extended systems. Prerequisite: Credit or registration in Phys. 301 and Math. 321 or consent of the department.
342. **Theoretical Mechanics, II.** 3 hours. Simple harmonic motion and resonance; moving coordinate frames; fictitious forces and conservation laws; special theory of relativity. Prerequisite: Phys. 341.
343. **Theoretical Mechanics, III.** 3 hours. Rigid body motion in three dimensions; motion in gravitational fields; generalized coordinates and Lagrange and Hamilton equations; equations of constraint; and small-vibration theory. Prerequisite: Phys. 342.
361. **Thermodynamics.** 3 hours. Zeroth, first and second and third laws of thermodynamics; the properties of the entropy, enthalpy, free energy, and internal-energy functions, applications to simple physical and chemical systems; thermodynamic inequalities and equilibrium; phase transitions. Prerequisite: Phys. 302 or consent of the department.
362. **Kinetic Theory and Statistical Mechanics.** 3 hours. Molecular collisions, transport phenomena, scattering and momentum transfer, distribution functions, thermodynamic properties, introduction to quantum statistics, Bose-Einstein and Fermi-Dirac statistics. Prerequisite: Phys. 361 or consent of the department.
371. **Light (Wave Optics).** 4 hours. Wave propagation and Maxwell's equations, interference and interferometers, gratings, circular aperture, echelon, resolving. Prerequisites: Phys. 114; credit or registration in Math. 321.
372. **Light (Modern Optics, I).** 4 hours. Crystals, polarized light, optics of metals, quantum theory of radiation, transition probability and oscillator strength, dispersion and scattering theory. Prerequisite: Phys. 371.

373. **Light (Modern Optics, II).** 3 hours. Gaussian optics and general laws, special optical systems and applications. Image formation, finite image-error theory spot diagrams. Necessary mathematical tools for Fourier analysis and transfer functions. Prerequisite: Phys. 372.
381. **Modern Experimental Physics, I.** 3 hours. Techniques and experiments in the physics of atoms, atomic nuclei, molecules, the solid state, and other areas of modern physical research. Prerequisite: Phys. 304, credit or registration in 331.
382. **Modern Experimental Physics, II.** 3 hours. Continues Phys. 381. Prerequisite: Phys. 381.
391. **Seminar.** 1 hour. Topics to be arranged. Prerequisite: Senior standing and consent of the instructor.
392. **Undergraduate Research.** 2-4 hours. Research under close supervision of a faculty member. Prerequisite: Consent of the instructor.

PLASTIC AND GRAPHIC ARTS

201. **Colloquium.** 1 hour. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of foundation program.
202. **Intermediate Drawing and Painting.** 2 hours. Various media. Prerequisite: Completion of foundation program.
203. **Intermediate Painting.** 3 hours. Theories and practices of color and color phenomena; pigment, light, and spatial illusion. Prerequisite: Completion of foundation program.
204. **Intermediate Painting.** 4 hours. Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: Completion of foundation program.
205. **Intermediate Painting.** 5 hours. Abstract painting: Theories of spatial organization, optical phenomena, experimental employment of various media. Prerequisite: Completion of foundation program.
206. **Colloquium.** 1 hour. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 201.
207. **Intermediate Painting.** 2 hours. Continues PGA 202. Various media. Prerequisite: Any one of PGA 202, 203, 204, 205.
208. **Intermediate Painting.** 3 hours. Continues PGA 203. Theories and practices of color and color phenomena; pigment, light, and spatial illusion. Prerequisite: Any one of PGA 202, 203, 204, 205.
209. **Intermediate Painting.** 4 hours. Continues PGA 204. Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: Any one of PGA 202, 203, 204, 205.
210. **Intermediate Painting.** 5 hours. Continues PGA 205. Abstract painting: Theories of spatial organization, optical phenomena, experimental employment of various media. Prerequisite: Any one of PGA 202, 203, 204, 205.
211. **Colloquium.** 1 hour. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 206.
212. **Intermediate Painting.** 2 hours. Continues PGA 207. Various media. Prerequisite: Any one of PGA 207, 208, 209, 210.

213. **Intermediate Painting. 3 hours.** Continues PGA 208. Theories and practices of color and color phenomena; pigment, light, and spatial illusion. Prerequisite: Any one of PGA 207, 208, 209, 210.
214. **Intermediate Painting. 4 hours.** Continues PGA 209. Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: Any one of PGA 207, 208, 209, 210.
215. **Intermediate Painting. 5 hours.** Continues PGA 210. Abstract painting: Theories of spatial organization, optical phenomena, experimental employment of various media. Prerequisite: Any one of PGA 207, 208, 209, 210.
216. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 211.
217. **Advanced Painting. 2 hours.** Theory and practice involving the integration of object imagery and abstract concepts. Prerequisite: Any one of PGA 212, 213, 214, 215.
220. **Advanced Painting. 5 hours.** Comprehensive-project oriented. Prerequisite: Any one of PGA 212, 213, 214, 215.
221. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 216.
222. **Advanced Painting. 2 hours.** Continues PGA 217. Theory and practice involving the integration of object imagery and abstract concepts. Prerequisite: Any one of PGA 217, 220, 318, 319, 320.
223. **Advanced Painting. 3 hours.** Synthesizing object imagery and abstract concepts, with emphasis on spatial analysis and color in various media. Prerequisite: Any one of PGA 217, 220, 318, 319, 320.
225. **Advanced Painting. 5 hours.** Continues PGA 220. Comprehensive-project oriented. Prerequisite: Any one of PGA 217, 220, 318, 319, 320.
226. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 221.
227. **Advanced Painting. 2 hours.** Continues PGA 222. Theory and practice involving the integration of object imagery and abstract concepts. Prerequisite: Any one of PGA 222, 223, 225, 324, 325.
228. **Advanced Painting. 3 hours.** Continues PGA 223. Synthesizing object imagery and abstract concepts with emphasis on spatial analysis and color in various media. Prerequisite: PGA 222, 223, 224, 324, 325.
230. **Advanced Painting. 5 hours.** Continues PGA 225. Comprehensive-project oriented. Prerequisite: Any one of PGA 222, 223, 225, 324, 325.
231. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of foundation program.
232. **Intermediate Sculpture. 2 hours.** Principles of time and motion sculpture in various means and materials. Prerequisite: Any one of the PGA foundation courses.
233. **Intermediate Sculpture. 3 hours.** Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: Completion of PGA foundation program.
234. **Intermediate Sculpture. 4 hours.** Comprehensive, stressing form and shape concepts, using methods of addition and extension in various media. Prerequisite: Completion of PGA foundation course.

235. **Intermediate Sculpture. 5 hours.** Abstract sculpture, investigating the principles of light, color volume, and scale, done as static construction in various materials. Prerequisite: Completion of PGA foundation program.
236. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field.
237. **Intermediate Sculpture. 2 hours.** Forming processes. Prerequisite: Any one of PGA 232, 233, 234, 235.
238. **Intermediate Sculpture. 3 hours.** Continues PGA 233. Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: Any one of PGA 232, 233, 234, 235.
239. **Intermediate Sculpture. 4 hours.** Continues PGA 232. Principles of time and motion sculpture in various means and materials. Prerequisite: Any one of PGA 232, 233, 234, 235.
240. **Intermediate Sculpture. 5 hours.** Continues PGA 235. Abstract sculpture, investigating the principles of light, color volume, and scale, done as static constructions in various materials. Prerequisite: Any one of PGA 232, 233, 234, 235.
241. **Colloquium. 1 hour.** Continues PGA 236. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 236.
242. **Intermediate Sculpture. 2 hours.** Continues PGA 237. Forming processes. Prerequisite: Any one of PGA 237, 238, 239, 240.
243. **Intermediate Sculpture. 3 hours.** Continues PGA 238. Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: Any one of PGA 237, 238, 239, 240.
244. **Intermediate Sculpture. 4 hours.** Continues PGA 239. Principles of time and motion sculpture in various means and materials. Prerequisite: Any one of PGA 237, 238, 239, 240.
245. **Intermediate Sculpture. 5 hours.** Continues PGA 240. Abstract sculpture, investigating the principles of light, color volume, and scale, done as static construction in various materials. Prerequisite: Any one of PGA 237, 238, 239, 240.
246. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 241.
247. **Advanced Sculpture. 2 hours.** Principles of light, form, and scale in essentially subtractive methods, executed in various media and means. Prerequisite: Any one of PGA 242, 243, 244, 245.
249. **Advanced Sculpture. 4 hours.** Projects involving figurative and abstract sculpture, emphasizing principles of scale and form relationships in various media through both direct and indirect means. Prerequisite: Any one of PGA 242, 243, 244, 245.
251. **Colloquium. 1 hour.** Continues PGA 246. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 246.
252. **Advanced Sculpture. 2 hours.** Continues PGA 247. Principles of light, form, and scale in essentially subtractive methods, executed in various media and means. Prerequisite: Any one of PGA 247, 249, 348, 350.
256. **Colloquium. 1 hour.** Continues PGA 251. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 251.

- 257. Advanced Sculpture. 2 hours.** Continues PGA 252. Principles of light, form, and scale in essentially subtractive methods, executed in various media and means. Prerequisite: Any one of PGA 252, 353, 354, 355.
- 261. Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: Completion of PGA foundation program.
- 262. Intermediate Printmaking. 2 hours.** Object and abstract studies relating the principles of drawing and design to the techniques of lithography and serigraphy. Prerequisite: Completion of PGA foundation program.
- 263. Intermediate Printmaking. 3 hours.** Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Completion of PGA foundation program.
- 264. Intermediate Printmaking. 4 hours.** Based on single and multiple object imagery. Theory, technique, and practice in the various graphic media, emphasizing experimentation. Prerequisite: Completion of PGA foundation program.
- 265. Intermediate Printmaking. 5 hours.** Advanced theories of spatial principles, form, and color, developed through the various printmaking media. Prerequisite: Completion of PGA foundation program.
- 266. Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 261.
- 267. Intermediate Printmaking. 2 hours.** Continues PGA 262. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Any one of PGA 262, 263, 264, 265.
- 268. Intermediate Printmaking. 3 hours.** Continues PGA 263. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Any one of PGA 262, 263, 264, 265.
- 269. Intermediate Printmaking. 4 hours.** Continues PGA 264. Based on single and multiple object imagery. Theory, technique, and practice in the various graphic media, emphasizing experimentation. Prerequisite: Any one of PGA 262, 263, 264, 265.
- 270. Intermediate Printmaking. 5 hours.** Continues PGA 265. Advanced theories of spatial principles, form, and color, developed through the various printmaking media. Prerequisite: Any one of PGA 262, 263, 264, 265.
- 271. Colloquium. 1 hour.** Continues PGA 266. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 266.
- 272. Intermediate Printmaking. 2 hours.** Continues PGA 267. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Any one of PGA 267, 268, 269, 270.
- 273. Intermediate Printmaking. 3 hours.** Continues PGA 268. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Any one of PGA 267, 268, 269, 270.
- 274. Intermediate Printmaking. 4 hours.** Continues PGA 269. Based on single and multiple object imagery. Theory, technique, and practice in the various graphic media, emphasizing experimentation. Prerequisite: Any one of PGA 267, 268, 269, 270.
- 275. Intermediate Printmaking. 5 hours.** Continues PGA 270. Advanced theories of spatial principles, form, and color, developed through the various printmaking media. Prerequisite: Any one of PGA 267, 268, 269, 270.

276. **Colloquium. 1 hour.** Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 271.
277. **Advanced Printmaking. 2 hours.** Theory and practice involving the synthesis of object imagery, abstract concepts, and media in printmaking. Prerequisite: Any one of PGA 272, 273, 274, 275.
281. **Colloquium. 1 hour.** Continues PGA 276. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 276.
282. **Advanced Printmaking. 2 hours.** Continues PGA 277. Theory and practice involving the synthesis of object imagery, abstract concepts, and media in printmaking. Prerequisite: Any one of PGA 277, 378, 379, 380.
286. **Colloquium. 1 hour.** Continues PGA 281. Current problems in the plastic and graphic arts presented by professionals active in the field. Provides a basis for planning, executing, and evaluating projects in courses in the student's major field. Prerequisite: PGA 281.
287. **Advanced Printmaking. 2 hours.** Continues PGA 282. Theory and practice involving the synthesis of object imagery, abstract concepts, and media in printmaking. Prerequisite: Any one of PGA 282, 383, 384, 385.
318. **Synthesis of Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of PGA 212, 213, 214, 215.
319. **Advanced Painting. 4 hours.** Scale, form, and proportion appropriate to architectural spaces, using a wide range of materials and techniques. Project models and presentation required. Prerequisite: Any one of PGA 212, 213, 214, 215.
320. **Advanced Painting. 5 hours.** Projects based on object imagery where scale and form are appropriate to spaces in architectural contexts, involving both traditional and contemporary media. Total presentation, models required; techniques of presentation. Prerequisite: Any one of PGA 212, 213, 214, 215.
324. **Advanced Painting. 4 hours.** Continues PGA 319. Scale, form, and proportion appropriate to architectural spaces, using a wide range of materials and techniques. Project models and presentation required. Prerequisite: Any one of PGA 217, 220, 318, 319, 320.
325. **Advanced Painting. 5 hours.** Continues PGA 320. Projects based on object imagery where scale and form are appropriate to spaces in architectural contexts, involving both traditional and contemporary media. Total presentation, models required; techniques of presentation. Prerequisite: Any one of PGA 217, 220, 318, 319, 320.
329. **Advanced Painting. 4 hours.** Continues PGA 324. Scale, form, and proportion appropriate to architectural spaces, using a wide range of materials and techniques. Project models and presentation required. Prerequisite: Any one of PGA 222, 223, 225, 324, 325.
330. **Advanced Painting. 5 hours.** Continues PGA 325. Projects based on object imagery where scale and form are appropriate to spaces in architectural contexts, involving both traditional and contemporary media. Total presentation, models required; techniques of presentation. Prerequisite: Any one of PGA 222, 223, 225, 324, 325.
348. **Synthesis of the Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of PGA 242, 243, 244, 245.
350. **Advanced Sculpture. 5 hours.** Projects, object imagery or abstract sculpture

- appropriate to architectonic spaces. Prepared drawings and models, unlimited materials and presentation methods. Prerequisite: Any one of PGA 242, 243, 244, 245.
353. **Advanced Sculpture. 3 hours.** Major developments synthesizing object imagery and abstract concepts with emphasis on scale and spatial relations. Prerequisite: Any one of PGA 247, 249, 348, 350.
354. **Advanced Sculpture. 4 hours.** Continues PGA 249. Projects involving figurative and abstract sculpture, emphasizing principles of scale and form relationships in various media through both direct and indirect means. Prerequisite: Any one of PGA 247, 249, 348, 350.
355. **Advanced Sculpture. 5 hours.** Continues PGA 350. Projects, object imagery or abstract sculpture appropriate to architectonic spaces. Prepared drawings and models, unlimited materials and presentation methods. Prerequisite: Any one of PGA 247, 249, 348, 350.
358. **Advanced Sculpture. 3 hours.** Continues PGA 353. Major developments synthesizing object imagery and abstract concepts with emphasis on scale and spatial relations. Prerequisite: Any one of PGA 252, 353, 354, 355.
359. **Advanced Sculpture. 4 hours.** Continues PGA 354. Projects involving figurative and abstract sculpture, emphasizing principles of scale and form relationships in various media through both direct and indirect means. Prerequisite: Any one of PGA 252, 353, 354, 355.
360. **Advanced Sculpture. 5 hours.** Continues PGA 355. Projects, object imagery or abstract sculpture appropriate to architectonic spaces. Prepared drawings and models, unlimited materials and presentation methods. Prerequisite: Any one of PGA 252, 353, 354, 355.
378. **Synthesis of the Plastic Arts and Design. 3 hours.** Interrelation of the plastic and graphic arts through experiences with two-dimensional and three-dimensional projects. Prerequisite: Any one of PGA 272, 273, 274, 275.
379. **Advanced Printmaking. 4 hours.** Emphasizing the integration of print units into a large-scale context. Prerequisite: Any one of PGA 272, 273, 274, 275.
380. **Advanced Printmaking. 5 hours.** Primarily abstract, emphasizing color, and the elements of organization, synthesizing mass printing techniques with the hand process. Prerequisite: Any one of PGA 272, 273, 274, 275.
383. **Advanced Printmaking. 3 hours.** Art-print making, synthesizing the various media, with emphasis on advanced theories of color and form. Prerequisite: Any one of PGA 277, 378, 379, 380.
384. **Advanced Printmaking. 4 hours.** Continues PGA 379. Emphasizing the integration of print units into a large-scale context. Prerequisite: Any one of PGA 277, 378, 379, 380.
385. **Advanced Printmaking. 5 hours.** Continues PGA 380. Primarily abstract, emphasizing color and the elements of organization, synthesizing mass-printing techniques with the hand process. Prerequisite: Any one of PGA 277, 378, 379, 380.
388. **Advanced Printmaking. 3 hours.** Continues PGA 383. Art-print making, synthesizing the various media, with emphasis on advanced theories of color and form. Prerequisite: Any one of PGA 282, 383, 384, 385.
389. **Advanced Printmaking. 4 hours.** Continues PGA 384. Emphasizing the integration of print units into a large-scale context. Prerequisite: Any one of PGA 282, 383, 384, 385.
390. **Advanced Printmaking. 5 hours.** Continues PGA 385. Primarily abstract, emphasizing color and the elements of organization, synthesizing mass-printing techniques with the hand process. Prerequisite: Any one of PGA 282, 383, 384, 385.

POLITICAL SCIENCE

150. **American Government: Basic Principles.** 4 hours. Historical development and operation of the American constitutional system. Analysis of federalism, civil liberties, methods of popular control of government. PolS. 150, 151 is a closely integrated sequence of courses. Majors in the department must take both. Prerequisite: Sophomore standing.
151. **American Government: Organization and Powers.** 4 hours. Nature, structure, powers, and procedures of legislative, executive, and judicial departments in state and nation. Basic structure of local government. Prerequisite: PolS. 150.
205. **Municipal Government and Administration.** 4 hours. Growth of cities in the United States; legal problems of cities; intergovernmental relations; charters and charter drafting; powers and forms of government organization; politics and pressure-group activity; administrative organization; municipal functions and services; revenue problems. Prerequisite: PolS. 150, 151.
212. **State Government.** 4 hours. Organization and powers of state governments in the United States; constitutions and problems of revision; legislatures and legislation; administrative problems; judiciary and judicial reform; intergovernmental relations; financing major services. Prerequisite: PolS. 150, 151.
226. **Political Parties.** 4 hours. Historical development, organization, and functioning of state and national parties; committees, conventions, campaigns, and finances. party platforms and issues. Prerequisite: PolS. 150, 151.
227. **Public Opinion and Propaganda.** 4 hours. The nature of public opinion and propaganda; the role of mass media and other forces shaping public opinion; problems of polling and behavior analysis; propaganda techniques; the impact of public opinion and propaganda upon decision making and the formation of public policy. Prerequisite: PolS. 150, 151.
261. **Public Administration.** 4 hours. The principles of public administration on all levels of government: budgeting, finance, and personnel functions; organization and administration of staff and line agencies; relations with legislative and judicial departments. Prerequisite: PolS. 150, 151.
281. **United States Foreign Policy.** 4 hours. Analysis of the internal and external factors which influence the formulation and execution of the foreign policy of the United States. Major problems of contemporary foreign policy; constitutional, organizational, administrative, and intellectual factors.
284. **Introduction to International Relations.** 4 hours. The basic characteristics of the international system; the nature of international relations; major problems and conflicts; the attempts to solve them. Nationalism, diplomacy, and war.
285. **Comparative Foreign Policies.** 4 hours. Foreign policies of major nations and blocs of nations; major national interests; substance of foreign policies; methods of policy formulation.
286. **International Organization.** 4 hours. The evolution, structure and operation of various types of contemporary international institutions. Special attention to the United Nations, its history, operations, and progress.
307. **Urban Politics Seminar.** 4 hours. The structure and dynamics of political parties and organizations in urban areas. Intensive study of the power structure, strength, and weakness of the Democratic and Republican parties in urban areas, using Chicago and its suburbs as a laboratory. Prerequisite: PolS. 205.
316. **The President and Congress.** 4 hours. The relationship of the President and Congress; problems involved in the formulation and execution of public policy. Prerequisite: PolS. 150, 151.

328. **Political Behavior.** 4 hours. An introduction; includes analysis of voting behavior, political leadership, policy formation, and related matters. Prerequisite: PolS. 227 or consent of the instructor.
334. **Comparative Government: Great Britain.** 4 hours. The government of Great Britain, compared especially with the United States and the U.S.S.R. to illustrate and contrast the politics and governments of democracies and dictatorships.
335. **Comparative Government: The Soviet Union.** 4 hours. The nature, evolution, and problems of the political and economic system of the U.S.S.R.
336. **Comparative Government: France and Germany.** 4 hours. Evolution of the political systems; analysis of reforms since 1945; operation of the governments and political parties.
351. **Constitutional Law.** 4 hours. Constitutional provisions and principles as they have developed through Supreme Court interpretation; the amending process; federalism; commerce, taxing, and war powers; due process of law; the constitutional relations between the three major branches of government. Prerequisite: PolS. 150, 151.
353. **Seminar in Problems of Constitutional Law.** 4 hours. Supervised individual study of selected problems arising in the interpretation of the United States Constitution. Prerequisite: PolS. 351 or 355.
355. **The Constitution and Civil Liberties.** 4 hours. The nature and constitutional positions of freedom of religion, speech, press, and others; varying interpretations of these freedoms; difficulties encountered in protecting them; problems of discrimination against racial, religious, and other minorities. Prerequisite: PolS. 150, 151.
380. **Introduction to the Study of Emerging Nations.** 4 hours. A comparative study of the political, economic, and social characteristics of underdeveloped nations. Colonialism, nationalism, political ideologies, and problems of effective political organization and functioning. Prerequisite: Six hours of political science, economics, or modern history.
381. **Politics of Emerging Areas.** 4 hours. Analysis of selected governments and blocs of governments in Asia, Africa, and Latin America which represent different types of problems and different stages of the development process. Relations between underdeveloped and developed areas, with emphasis on United States aid policies. Prerequisite: PolS 380.
390. **Political Analysis: Methods and Techniques.** 4 hours. Analytic processes in the development of concepts, hypotheses, and theories; discussion of the derivation, formulation, and specification of research problems to be related to basic methodologies and modes of analysis. Prerequisite: PolS 150 and 151 or consent of the instructor.
393. **History of Political Theory.** 4 hours. The evolution of western political thought from the Greeks through the Middle Ages. Greek, Roman, and Scholastic political thought; analysis of selections from the writings of outstanding thinkers of the period.
394. **History of Political Theory.** 4 hours. Continues PolS 393. Development of modern political thought since Machiavelli; the influence of Hobbes, Locke, and Rousseau on the development of liberalism and the modern welfare state; the crisis of modern democracy analyzed against the perspectives of recent political thought. Prerequisite: PolS 393.
397. **American Political Thought.** 4 hours. The colonial, revolutionary, constitution-making, and Civil War periods; consideration of recent criticisms and defense of popular government as applied in the United States.

PSYCHOLOGY

100. **Introduction to Psychology.** 4 hours. No credit if student has credit in Psch. 102. Introduction to the study of behavior; methods, principles, and applications to the understanding of human actions. Lectures, demonstrations, laboratory investigations.
102. **Introduction to Psychonomic Science.** 5 hours. No credit if student has credit in Psch 100. Systematic introduction to psychology as a behavioral science; methods of psychological investigation, research findings, theoretical interpretations. Lectures, demonstrations, discussion sections, laboratory experiments. Prerequisite: Honors status or consent of the instructor.
110. **Psychology of Adjustment.** 4 hours. Basic principles of behavior in relation to the development, modifications, and assessment of adjustive processes. Prerequisite: Psch. 100 or 102.
115. **Social Psychology.** 4 hours. The principles of behavior applied to the individual in the social situation. Prerequisite: Psch. 100 or 102.
130. **Psychology in Business and Industry.** 4 hours. Principles of behavior applied to problems of personnel selection, training, and work efficiency. Prerequisite: Psch. 100 or 102 or consent of instructor.
210. **Psychology of Personality.** 4 hours. Systematic study of the development, dynamics, and structure of personality; methodology, theory, and empirical research. Prerequisite: 8 hours of psychology.
215. **Psychology of Attitude and Opinion.** 5 hours. Same as Spch. 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participation in field and laboratory studies. Individual projects and readings are assigned. Prerequisite: 8 hours of psychology or consent of the instructor for well-qualified speech majors.
220. **Psychology of Childhood and Adolescence.** 4 hours. Development of behavior in infancy, childhood, and youth; emphasis on learning, motivational, and biosocial factors. Prerequisite: 8 hours of psychology.
222. **Psychology of Adulthood and Old Age.** 4 hours. Determinants of adjustment in marriage; educational and vocational pursuits, retirement, and old age; learning, motivational, and biosocial factors. Prerequisite: 8 hours of psychology.
224. **Educational Psychology.** 4 hours. For prospective teachers. Facts and principles of child development, learning, concept formation, acquired motivation, and achievement testing applied to the classroom situation. Prerequisite: Psch. 100 or 102.
226. **Psychology of Learning and Teaching.** 4 hours. Systematic survey of the principles of human learning; emphasis on research findings and theoretical formulations. Task, situational, and individual differences variables in controlling the acquisition of skills and concepts. Prerequisite: 8 hours of psychology.
230. **Occupational and Vocational Psychology.** 4 hours. Survey of relations of individual aptitudes, interests, and personality characteristics to occupational choice and success. Prerequisite: 8 hours of psychology or consent of the instructor.
232. **Personnel Psychology.** 4 hours. Systematic study of the development and utilization of psychological techniques of personnel selection, classification, and assessment. Prerequisite: Psch. 130.
240. **Introduction to Psychological Testing.** 4 hours. Introduction to the principles of psychological rating, testing, and polling, with a survey of representative techniques. Emphasis on the basic concepts of objectivity, reliability, and validity.

- Lectures, laboratory, and conference sections. Not open to students electing Psch. 243. Prerequisite: 8 hours of psychology.
243. **Statistical Methods in Behavioral Science. 5 hours.** No credit if student has credit in Econ. 172 and 173 or Soc. 185. Introduction to the use of statistics in behavioral research: descriptive statistics, statistical inference, elementary correlational methods. Lectures, laboratory, and conference sections. Prerequisite: 8 hours of psychology or sociology and consent of the instructor.
247. **Differential Psychology. 4 hours.** The nature, determinants, and correlates of individual and group differences in behavior. Prerequisite: Psch. 240, 243, or consent of the instructor.
250. **Introduction to Experimental Psychology, I. 5 hours.** Critical survey of experimental findings, methods of research, and laboratory practicum in basic areas of psychology: psychophysical methods, sensory processes, perception. Prerequisite: Psch. 102 and 243, or equivalent.
251. **Introduction to Experimental Psychology, II. 5 hours.** Continues Psch. 250. Learning, retention, motivation. Prerequisite: Psch. 250.
256. **Physiological Psychology. 5 hours.** The physiological correlates of behavior, including sensory processes, motivation, emotion, learning, and intelligence. Prerequisite: 8 hours of psychology, including Psch. 102 or consent of the instructor.
260. **Human Engineering. 4 hours.** Application of principles of behavior to the design of equipment for efficient human use and operation. Sensory and perceptual processes, motor skills, and experimental methodology. Prerequisite: Psch. 100 or 102 and consent of the instructor.
291. **Special Topics (Honors). 2 hours.** Seminar on selected problems. Reading, discussion, and written reviews of current technical literature. Prerequisites: Psch. 250, 251, senior standing, and consent of the instructor.
292. **Special Topics (Honors). 2 hours.** Seminar on selected problems. Reading, discussion, and written reviews of current technical literature. Prerequisites: Psch. 250, 251, senior standing, and consent of the instructor.
293. **Readings and Research. 2-6 hours.** Individual investigation of a special problem under direction of a staff member. Prerequisites: 15 hours in psychology with grade-point average of 4.0, consent of the instructor, and approval by the head of the department.
294. **Readings and Research. 2-6 hours.** Continues Psch. 293. Prerequisite: Psch. 293, consent of the instructor, and approval of the head of department.
340. **Psychological Assessment. 4 hours.** Systematic analysis of the nature of psychological tests and their application; introduction to intelligence, achievement, personality, and interest tests. Practice in administration and interpretation. Prerequisite: Psch. 243 or equivalent and consent of the instructor.
370. **Theories of Psychology. 4 hours.** Critical survey of major historical systematic positions and current theoretical issues. Prerequisite: 15 hours in psychology with grade-point average of 4.0 or consent of the instructor.
380. **Abnormal Psychology. 4 hours.** Forms and determinants of behavior and personality disorders. Prerequisite: 15 hours in psychology with grade-point average of 4.0 or consent of the instructor.

QUANTITATIVE ANALYSIS—BUSINESS ADMINISTRATION

170. **Statistics, I. 3 hours.** The place of statistics in decision making. Quantitative data: Origins, characteristics, precision, sources, editing. Universe and sample;

accuracy and precision. Dispersion and average; the concept, meaning, and calculation. Prerequisite: Math. 110, 111, and 112 (or concurrent registration in 112), or equivalent.

171. **Statistics, II. 3 hours.** The nature and contributions of probability theory to the study of uncertainty. Probability distributions; sampling distributions. Concept and measurement of reliability of pertinent statistics. Nonparametric statistics and their use in decision making. Prerequisite: QABA 170 or equivalent.
172. **Statistics, III. 3 hours.** Two and higher dimensional distributions for different types of data. Concept and measurement of reliability of pertinent statistics. Application of distribution-free statistics to modern decision making. Prerequisite: QABA 171.
370. **Multivariate Analysis. 3 hours.** Analytical approach to the causes and measurement of variance among variables. Measures of reliability for pertinent statistics. Applications presented through demonstration and practice, including electronic computers. Prerequisite: QABA 172.
371. **Survey Research. 3 hours.** Survey design, including census or sample, pilot exploration; criteria for returns evaluation; nonresponse; reliability of results. Prerequisite: QABA 172.
375. **Information Systems, I. 3 hours.** Principles of information systems; general implications for administration and management; implications for specific functional fields of accounting, finance, and marketing. Each student will develop an information system using a current computer language (such as COBAL) for his own area of specialization.
376. **Information Systems, II. 3 hours.** Advanced topics in information systems analysis; their applications and implications for administration and management. A term project in the student's special field of interest will be an essential part of the course. Prerequisite: QABA 375.

RHETORIC

101. **Freshman Rhetoric and Composition. 4 hours.** Elementary training and practice in the comprehension and expression of written English.
102. **Freshman Rhetoric and Composition. 4 hours.** Elementary training and practice in the comprehension and expression of written English. Prerequisite: Rhet. 101.
133. **Principles of Composition. 4 hours.** Practice in exposition; emphasis on organization, paragraphing, and sentence structure. Credit is not given for both Rhet. 133 and 143. Prerequisite: Grade of A or B in Rhet. 102 or consent of the instructor.
143. **Intermediate Expository Writing. 4 hours.** Practice in expository types; emphasis on style and critical analysis. Prerequisite: Grade of A or B in Rhet. 102 or consent of the instructor.
144. **Narrative Writing. 4 hours.** Provides practice in the writing of description, narrative sketches, stories. Prerequisite: Rhet. 101; 102 with a grade of A or B; or consent of the instructor.
200. **Remedial Writing. Noncredit.** For students who have failed to pass the qualifying examination in English. Prerequisite: Rhet. 102 or equivalent.
210. **The Teaching of English. 4 hours.** Designed for prospective teachers of English in secondary schools. Emphasis on theory and practice in teaching English. Prerequisite: Senior standing in teacher education or consent of the department.
246. **Modern English Grammar. 4 hours.** Provides study in definition and meaning; use of dictionaries; grammars; survey of syntax. Prerequisite: Junior standing.

251. **Business Writing. 4 hours.** Study and practice in written informative and/or persuasive communications in business and industry. Prerequisite: Rhet. 101 and 102.
330. **The Writing of Poetry, I. 4 hours.** May be repeated for a maximum of 9 hours credit. Limited to 15 students. The practice of the writing of poetry, aided by intensive study of examples. Prerequisite: Junior standing and 9 hours of English literature or consent of the instructor.
331. **The Writing of Poetry, II. 4 hours.** Limited to 15 students. Continues Rhet. 330. Prerequisite: Junior standing and 9 hours of English literature or consent of the instructor.
332. **The Writing of Poetry, III. 4 hours.** Continues Rhet. 331. Prerequisite: Junior standing and 9 hours of English literature or consent of the instructor.

RHETORIC FOR FOREIGN STUDENTS

103. **English as a Foreign Language. Noncredit.** Intensive review in basic English structure for foreign students inadequately prepared for Rhet. 101. Prerequisite: Reading knowledge of English and ability to understand instructions.
104. **English as a Foreign Language. Noncredit.** Continues Rhet. 103. A rapid, intensive review of basic English structure; study of more complicated sentence patterns; practice in oral and written composition. For students who may be inadequately prepared for Rhet. 101. Prerequisite: Rhet. 103 or consent of instructor.
105. **English as a Foreign Language. Noncredit.** Intensive remedial writing for the foreign student in the area of his special difficulties. May be taken concurrently with Rhet. 101. Prerequisite: Rhet. 104 or consent of instructor.

RUSSIAN

101. **Elementary Russian. 4 hours.** Students must have credit in Russ. 101, 102, 103 to receive graduation credit in 101. Reading, writing, oral-aural practice, elements of grammar. For students who have had no work in Russian. Four half hours per week in the language laboratory required.
102. **Elementary Russian. 4 hours.** Students must have credit in 102 to receive graduation credit in 103. Continues Russ. 101. Four half hours per week in the language laboratory. Prerequisite: Russ. 101 or equivalent.
103. **Elementary Russian. 4 hours.** Continues Russ. 102. Four half hours per week in the language laboratory. Prerequisite: Russ. 102 or equivalent.
104. **Intermediate Russian. 4 hours.** Reading, oral-aural practice, systematic functional grammar. Four half hours per week in the language laboratory. Prerequisite: Russ. 103 or equivalent.
105. **Intermediate Russian. 4 hours.** Continues Russ. 104. Four half hours per week in the language laboratory. Prerequisite: Russ. 104 or equivalent.
106. **Intermediate Russian. 4 hours.** Continues Russ. 105. Four half hours per week in the language laboratory. Prerequisite: Russ. 105 or equivalent.

SOCIOLOGY

100. **Introduction to Sociology.** 4 hours. Analysis and description of the structure and dynamics of human society. The application of scientific methods to the observation and analysis of social norms, groups, intergroup relations, social change, social stratification, and institutions.
130. **Society and Individual Development.** 4 hours. Social psychology; role theory; influence of language in personality development and social behavior. Prerequisite: Soc. 100.
131. **Social Problems.** 4 hours. Sociological aspects of chief modern social problems; social interrelationships and culture conflicts involved in their genesis, significance, and amelioration or prevention. Prerequisite: Soc. 100 or consent of the instructor.
185. **Introduction to Social Science Research Methods.** 4 hours. The application of statistical methods. Research design and the role of statistics in sociological investigation, including measures of central tendency and dispersion, simple correlation techniques, contingency analysis, and introduction to statistical inference. Prerequisite: Soc. 100 or consent of the instructor or 8 hours in sociology, political science, anthropology, geography, or psychology.
215. **Collective Behavior.** 4 hours. Introduction to noninstitutional forms of group life; diffuse collectivities, the dynamics of crowds, social movements and revolution, public opinion and propaganda; the relationship of collective behavior to social change; techniques for analyzing collective phenomena. Prerequisite: Soc. 100, sophomore standing.
225. **Races and Cultural Minorities.** 4 hours. A sociological and social-psychological analysis of racial, religious, or other ethnic groups; consideration of some of the historical and current social problems resulting from their contacts in modern times. Prerequisite: Soc. 100.
251. **Foundations of Criminal Justice.** 4 hours. The development of law as a means of social control, from earliest records through Hammurabi; the Greek and Roman civilizations; European cultures; Anglo-Saxon Britain; the common law to the present constitutional, statutory, and case law controls in the United States. Prerequisite: Soc. 100.
252. **Administration of Criminal Justice.** 4 hours. The development and contemporary operations of the agencies of criminal justice, from police through the prosecution and judiciary to correctional institutions, including probation and parole procedures; current philosophies, practices, and interrelationships. Prerequisite: Soc. 251.
263. **Methods of Sociological Research.** 4 hours. Methodology and techniques. The application of principles of research and sampling design to sociological problems. Procedures for the collection and analysis of data. The fundamentals of qualitative and quantitative methods. Critical analysis of current sociological research. Prerequisite: Soc. 185.
276. **The Sociology of Urban Life in Industrial Society.** 4 hours. Life conditions in the modern city as they are affected by the institutions in a rapidly changing industrial society. Prerequisite: Soc. 100 and sophomore standing.
290. **Honors Course.** 4 hours. May be repeated for an additional 4 hours of credit. Individual study or research projects. Prerequisite: Major in sociology, senior standing, all-University 4.0 average, or consent of the instructor.
315. **Sociology of Education.** 4 hours. The relationship of the educational system to the social structure; the changing function of education in an advanced industrial society. The impact of education on technological changes and social mobility. Comparison of systems in various cultures. Prerequisite: Soc. 100 and junior standing.

318. **Industrial Sociology.** 4 hours. Industrial society; its institutions; the meaning of work and work relations and of the relationship between work and authority, with cross-cultural emphasis; analysis of collective bargaining and of the impact of industrial and labor organizations on the community and on society. Prerequisite: Soc. 100, junior standing.
320. **The Sociology of the Family.** 4 hours. The Family as a social institution; its origin, its nature of kinship, its development, and its prospects. Prerequisite: Soc. 263.
331. **Criminology.** 4 hours. Nature and extent of crime in American society; assessment and evaluation of the various factors and influences that lead to criminal behavior; various measures proposed for control of criminal behavior. Prerequisite: Soc. 100, junior standing.
332. **Juvenile Delinquency.** 4 hours. Various conceptions of the nature of juvenile delinquency and its causes; juvenile court movement; juvenile detention, treatment of juvenile offenders; delinquency prevention and control programs. Prerequisite: Soc. 100, junior standing.
351. **Medical Sociology.** 4 hours. Sociological contributions to medicine and public health; social organization and the organization of health services; the sociology of illness. Prerequisite: 8 hours of sociology, senior standing.
361. **Social Gerontology: Old People in American Society.** 4 hours. The aged: demographic trends, economic status, health needs, and family relationships. Prerequisite: 8 hours of sociology; senior standing.
371. **Population and Migration.** 4 hours. Human populations: social and cultural factors responsible for changes and the consequent effect of such changes on social life. Prerequisite: Soc. 185 or 263.

SPANISH

101. **Elementary Spanish.** 4 hours. Seniors, 3 hours. For students without credit in Spanish. A student must have credit in Span. 101, 102, and 103 to receive graduation credit for 101. Oral practice, reading, and grammar. Two additional half hours per week in the language laboratory.
102. **Elementary Spanish.** 4 hours; seniors, 3 hours. A student must have credit in Span. 103 to receive graduation credit in 102. Continues Span. 101. Two additional half hours per week in the language laboratory. Prerequisite: Span. 101, or equivalent.
103. **Elementary Spanish.** 4 hours; seniors, 3 hours. Continues Span. 102. Two additional half hours per week in the language laboratory. Prerequisite: Span. 102 or equivalent.
104. **Intermediate Spanish.** 4 hours. Rapid reading, grammar review, composition, conversation. Prerequisite: Span. 103 or two years of high school Spanish.
105. **Intermediate Spanish.** 4 hours. Continues Span. 104. Prerequisite: Span. 104 or equivalent.
106. **Intermediate Spanish.** 4 hours. Continues Span. 105. Prerequisite: Span. 105 or equivalent.
115. **Elementary Composition and Conversation.** 2 hours. Difficulty level: Span. 104 through 106. May be taken concurrently with 105 or 106. Does not count toward the major in Spanish. Prerequisite: Span. 104 or two years of high school Spanish.

211. **Intermediate Composition and Conversation.** 3 hours. Prerequisite: Span. 106 or four years of high school Spanish. Required for teacher training majors in Spanish.
217. **Spoken Spanish.** 3 hours. Intensive course. Exclusively oral-aural. Prerequisite: Span. 213 or equivalent.
218. **Spanish Literature to 1900.** 3 hours. Highlights of Spanish literature from its beginning through the nineteenth century. Required for teacher training majors in Spanish. Prerequisite: Span. 106 or equivalent.
221. **Drama and Poetry of the Twentieth Century.** 3 hours. The nature of contemporary Spanish drama and poetry. Reading of representative works by A. Machado, Lorca, J. R. Jimenez, Aleixandre, Benavente, Martinez Sierra, Buero Vallejo, and others. Prerequisite: Span. 106 or four years of high school Spanish. Required for teacher training majors in Spanish.
241. **Spanish Literature in Translation.** 4 hours. Major works from 1898 to the present. Prerequisite: Consent of the instructor.
280. **Teachers Course.** 3 hours. Required for teacher training majors in Spanish. A survey of resources, classroom materials, standard practices, instruction and practice in the audiovisual and language laboratory techniques; problems in the teaching of Spanish. Practical application to actual classroom situations. Prerequisites: Span. 211, 212, 213 or 221, 222 or 223, 224.
305. **Romanticism and Realism in Nineteenth Century Spanish Literature.** 3 hours. Representative outlines and genres of the nineteenth century, with particular emphasis on the romantic drama and the realistic novel. Prerequisite: Span. 221 and 222 or equivalent.
307. **The Generation of 1898.** 3 hours. Representative works of Baroja, Azorin, Unamuno, Maeztu, Valle Inclan, Benavente, A. Machado, and others. Prerequisite: Span. 221 and 222 or equivalent.
312. **Don Quixote and Prose of the Golden Age.** 3 hours. *Celestina*, *Lazarillo*, *novelas ejemplares*, Quevedo, and other material. Prerequisite: Span. 221 and 222 or equivalent.
331. **La Cultura Hispanica: Espana.** 3 hours. The cultural aspects of Spanish civilization. Prerequisite: Span. 221 and 222 or 223 and 224 or equivalent.

SPEECH AND THEATRE

101. **Principles of Effective Speaking.** 5 hours. Preparation and presentation of short, informative, persuasive speeches; emphasis on the selection, organization, and support of ideas; training in group discussion.
102. **Principles of Effective Public Speaking.** 4 hours. Prerequisite: James Scholar or Dean's List status, speech major, or consent of the head of the department.
105. **Voice and Articulation Laboratory.** Noncredit. Drill sessions designed to correct defects in articulation and voice. Prerequisite: Consent of instructor.
107. **Parliamentary Procedure.** 2 hours. Principles and practice.
111. **Foundations of Communication Theory.** 4 hours. The development of communication theory from Plato and Aristotle to the twentieth century. Consideration of concepts, including relationships between societal needs and communication theory, free speech, development of parliamentary institutions, and fundamental communication principles.
112. **Interpersonal Communication Theory.** 4 hours. Experimentally derived theories of communication. Communication models, information theory, field theory, channels, feedback, and cognitive dissonance.

113. **Mass Communication Theory.** 4 hours. Nature of mass communications, with particular consideration of major concepts, including communication technology and societal change, information transmission and diffusion, content analysis and the measurement of effects, the institutionalization of mass communications, freedom and responsibility in public and private channels, and the relationship of mass communications to mass culture.
121. **Introduction to the Theatre.** 4 hours. The nature and elements of theatre—the theories, styles, and semantics of theatre arts.
122. **Survey of Theatre History.** 4 hours. An introduction to the major historical periods in the development of the theatre and drama from ancient Greece to the present. Prerequisite: Spch. 121.
123. **Contemporary Theatre.** 4 hours. Critical and analytical study of current theatre productions. Students will attend and analyze several currently produced theatrical offerings in the Chicago area. Critical analysis based upon modern literary, production, and performance standards. Prerequisite: Spch. 121.
141. **Oral Interpretation of Literature.** 4 hours. Oral reading for understanding, appreciation, and communication.
151. **Introduction to Technical Theatre.** 4 hours. A lecture-laboratory approach to the basic techniques of play production. Historical background and sources, theories, styles, methods and materials of scene design, stage lighting, costuming, and makeup. Lectures, readings, and practical problems. Prerequisite: Spch. 121.
195. **Advanced Voice Training.** 3 hours. Designed to develop in the individual student's voice a wide range of controls in pitch, volume, and quality, to meet extraordinary voice and speech demands in broadcasting, interpretation, public address, teaching, and theatre. Prerequisite: Voice proficiency test, to be administered by the instructor.
201. **Bases of Speech.** 4 hours. The social, physical, physiological, neurological, phonetic, linguistic, psychological, genetic, and semantic bases of speech.
202. **Fundamentals of Phonetics.** 4 hours. Phonemics and phonetics; emphasis on pronunciation characteristics of American English, ear training, and practice in transcription.
203. **Anatomy and Physiology of the Speech Mechanism.** 4 hours. Anatomical and physiological characteristics of the normal speech-and-hearing mechanisms; physiology of speech production. Prerequisite: Spch. 201 and 202 or consent of the instructor.
204. **Speech Science.** 4 hours. Voice and speech as related to the physiology of the speech act, acoustics, and the hearing of speech. Prerequisite: Spch. 201 or 202 or consent of instructor.
211. **Discussion.** 4 hours. Study and practice in the theories and techniques of group discussion; the nature of small-group decision making; discussion as a learning technique. Prerequisite: Spch. 112.
212. **Argumentation.** 4 hours. The theory of argumentation; evidence, reasoning, and refutation; historical and contemporary debates and argumentative discourse; practice in argumentative speaking. Prerequisite: Spch. 101 or consent of instructor.
213. **Persuasion.** 4 hours. Principles of attitude change, including theories of persuasion and audience analysis. Practice and experimentation in persuasive speaking situations. Prerequisite: Spch. 111, 112, and 113 or 215, or consent of instructor.
215. **Psychology of Attitude and Opinion.** 5 hours. Same as Psch. 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participa-

- tion in field and laboratory studies. Prerequisite: 8 hours of psychology, or consent of the instructor for well-qualified speech majors.
231. **Television and Radio Performance.** 4 hours. The basic skills for effective dramatic and nondramatic television and radio performance; announcing, interviewing, and acting. Individual performance problems. Prerequisite: Spch. 113 or consent of instructor.
 232. **Television and Radio Production.** 4 hours. Basic patterns, tools, and techniques in production of documentary, panel, news, and dramatic television and radio programs, with progressive development through experience in studio and control room operations. Prerequisite: Spch. 113 or consent of instructor.
 233. **Television and Radio Directing.** 4 hours. Designed to develop style and skill in television and radio directing, with special attention to script analysis, staging, pictorial composition, audio placement and integration, control room operation, crew management, and rehearsal procedures. Prerequisite: Spch. 113, 231, 232.
 241. **Advanced Oral Interpretation.** 4 hours. Literary analysis of poetry, prose, and drama; platform presentation of literary materials. Prerequisite: Spch. 141 or consent of instructor.
 251. **Advanced Technical Theatre.** 4 hours. Advanced techniques of play production: Fundamentals of scene design, lighting, and costuming, such as illusion techniques, ornamentation, use of color, and techniques of rendering, plotting, and sketching. Practical work with University Theatre. Prerequisite: Spch. 121 and 151.
 261. **Fundamentals of Acting.** 4 hours. Methods of acting, with emphasis given to basic stage techniques, the role of the character in relation to the play as a whole. The intellectual and emotional values of the play and their interpretation by means of voice and action. Prerequisite: Spch. 121, 122, and 123.
 262. **Advanced Acting.** 4 hours. The psychology of acting; study of acting techniques in relation to various dramatic styles and periods. Projects emphasizing differences in acting styles of various periods and nationalities. Prerequisite: Spch. 261.
 264. **Fundamentals of Stage Directing.** 4 hours. Principles and techniques of the director's art. Fundamentals of staging; blocking, movement, business, tempo; script analysis and rehearsal planning. Prerequisite: Spch. 151 and 121.
 298. **Honors Course: Individual Study.** 3 hours. Individual study leading to a thesis or to a comprehensive examination for honors in the Department of Speech and Theatre. Course may be repeated for a maximum of 6 hours of credit. Prerequisite: Senior standing; 4.0 grade point average; or consent of the department head.
 299. **Individual Topics.** 3 hours. Individual investigation of special problems. This course may be repeated for a maximum of 6 hours of credit. Prerequisite: 10 hours of speech; 3.75 grade point average; consent of the department head.
 301. **Information Exchange and Analysis.** 4 hours. Descriptions, models, proposed dimensions, and mathematical treatment of the information exchange process. Prerequisite: Spch. 111, 112, 113.
 302. **Group Communication Theory.** 4 hours. Detailed analysis and observation of group processes from the viewpoint of modern information and field communication theory. Prerequisite: Spch. 111, 112, 113, or consent of the instructor.
 311. **American and British Public Address, I.** 4 hours. A critical and historical study of American and British speakers and their speeches to 1850. Prerequisite: Spch. 111, 112, 113, or consent of the instructor.
 312. **American and British Public Address, II.** 4 hours. Continues Spch. 311; 1850 to 1920. Prerequisite: Spch. 111, 112, 113, or consent of the instructor.
 313. **Contemporary Public Address.** 4 hours. Speechmaking, focusing principally

upon issues relating to economics and government, World War II, postwar international problems, and civil rights. Prerequisite: Spch. 111, 112, 113, or consent of the instructor.

321. **European Theatre History, I.** 4 hours. An historical survey of the theatre and theatre arts of ancient Greece, Rome, medieval Europe, the Italian Renaissance, and Elizabethan England. Prerequisite: Spch. 122 or consent of the instructor.
322. **European Theatre History, II.** 4 hours. An historical survey of the theatre and theatre arts from the seventeenth century to modern times in Europe and England. Prerequisite: Spch. 122 or consent of the instructor.
324. **American Theatre History.** 4 hours. Development of the American theatre from 1700 to the present; historical trends and dramatic literature. Prerequisite: Spch. 122 or consent of the instructor.
331. **Television and Radio Programming.** 4 hours. Broadcast program types, objectives, methods, and effects, and creative development of programs from conception to script. Prerequisite: Spch. 113, 232.
332. **Projects and Problems in Television and Radio.** 4 hours. Each student plans and executes an individual project of substantial dimensions in television and radio production and investigates some problem in broadcasting; culminates in a research paper. Prerequisite: Spch. 113, 232, 233, and 331.
333. **The Sociocultural Implications of Television.** 4 hours. Theories of mass communication; authoritarian, libertarian, communistic, and social responsibility as applied to television. Dynamics of television in its social setting. The forces that influence television programming and the reciprocal influence of that programming. Prerequisite: Spch. 113.

SPEECH FOR FOREIGN STUDENTS

103. **Speech for Foreign Students. Noncredit.** Sounds and intonation patterns of American English; relation of sound to spelling. Drill sessions designed to improve student's ability to speak and understand English at normal conversational speed. Prerequisite: Ready knowledge of English; ability to understand instructions.
104. **Speech for Foreign Students. Noncredit.** English pronunciation for students whose native language is not English. Sounds and intonation patterns of American English; designed to improve the student's ability to speak at a normal conversational pace. Pronunciation material similar to that in Spch. 103 but for more advanced students. Prerequisite: Spch. 103 or consent of the instructor.

STUDENT COUNSELING SERVICE

101. **Reading Improvement. No credit.** For students who wish to increase their reading rate or improve their vocabulary and comprehension skills.
102. **Study Skills Improvement. No credit.** For students who need to develop more effective study methods. Practice in competent study of reference materials, improving concentration, accurate note taking, and preparation for examinations.
103. **Vocabulary Development. No credit.** For students who need assistance in developing language skills. Use of vocabulary in thinking and communication. Practical exercises in vocabulary building.

104. **Career Planning. No credit.** For students who wish to clarify their vocational goals. Self-evaluation of abilities, interests, and personal needs as they bear on occupational choice.

SYSTEMS ENGINEERING

101. **Engineering Graphical Communications. 4 hours.** Conveying ideas by means of freehand sketches; orthographic projection, including auxiliary views; isometric and oblique projections; dimensioning; geometric and positional tolerancing; specification of materials; use of national standards; charts and diagrams. Prerequisite: Plane geometry.
102. **Engineering Geometry. 4 hours.** Theory of projections; the analysis and synthesis of theoretical and practical problems involving size, shape, and relative position of common geometrical magnitudes such as points, lines, planes, curved surfaces, and solids; intersections, shades and shadows, perspective projection. Prerequisite: Former G. E. 101.
103. **Engineering Graphics, I. 4 hours.** Freehand sketching; theory of orthographic projection and the analysis and synthesis of theoretical and practical problems involving the size, shape, and/or relative positions of common geometrical magnitudes, such as points, lines, planes, and other surfaces and solids; theory of pictorial projections; basic dimensioning; basic charts and diagrams.
104. **Engineering Graphics, II. 4 hours.** Dimensioning for interchangeable assembly, including geometric and positional tolerancing; specification of materials and processes; solution of problems requiring individual creativity. Prerequisite: Former G. E. 103 or equivalent.
201. **Introduction to Systems Analysis, I. 4 hours.** Mathematical modeling of physical elements; mechanical, electrical, fluid, thermal equilibrium of interconnected elements; integrodifferential equations. Prerequisite: Former Math. 143; former Phys. 107.
202. **Introduction to Systems Analysis, II. 4 hours.** Continues SysE. 201. Prerequisite: SysE. 201.
203. **Introduction to Systems Analysis, III. 4 hours.** Continues SysE. 202. Prerequisite: SysE. 202.
211. **Distributed Parameter Systems, I. 4 hours.** Mathematical modeling of distributed physical systems; electromagnetic, elastic, fluid, thermal, and acoustic. Introduction to potential, diffusion, and wave equations. Solution by analytic, graphical, and numerical methods. Prerequisite: Former Phys. 108; enrollment in SysE. 201, or equivalent.
212. **Distributed Parameter Systems, II. 4 hours.** Continues SysE. 211. Prerequisite: SysE. 211.
213. **Distributed Parameter Systems, III. 4 hours.** Continues SysE. 212. Prerequisite: SysE. 212.
220. **Industrial Production Illustration. 4 hours.** Mechanical and freehand drawings in axonometric, oblique, and perspective; shades and shadows; rendering of drawings with various media including some work with the airbrush. Industrial production illustration. Prerequisite: Former G. E. 103.
221. **Graphical Calculations. 3 hours.** Rectification of curves from laboratory data to devise empirical equations, using various types of coordinate paper. Construction and use of nomograms or alignment charts; introduction to graphical mathematics, graphical calculus; use of slide rule with special emphasis on the

log-log scales. Prerequisite: Former G. E. 103 or equivalent; registration in Math. 133.

222. Surveying, I. 4 hours. Fundamental operations. Prerequisite: Former Math. 263.

223. Surveying, II. 4 hours. Introduction to precise control surveys and route alignment; elements of aerial photogrammetry. Prerequisite: Former C. E. 203.

Index

- Accounting, 80
 - courses in, 119
- Academic Regulations, 34
- ACT Test, 58, 59
- Admission
 - additional records for, 59
 - application for, 56
 - by special action, 55
 - credentials required, 58
 - decision on, 59
 - Early Decision Plan, 58
 - foreign students, 49
 - permit, 57
 - priority groups, 56
 - service papers, 59
 - transfer students, 49
 - when to apply, 57
- Admission Procedures, 56
- Admission Requirements, 48
 - Architecture and Art, 50
 - Business Administration, 51
 - chemical engineering, 54
 - chemistry, 53
 - criminal justice,
 - administration of, 53
 - physical education, 54
 - deaf and hard-of-hearing,
 - teaching of, 51
 - Education, 51
 - elementary education, 51
 - Engineering, 52
 - exemptions from, 55
 - 45-hour rule, 56
 - Liberal Arts and Sciences, 53, 54
 - medical record administration, 53
 - medical technology, 53
 - occupational therapy, 53
 - Physical Education, 54
 - physics, 54
 - predentistry, 53
 - premedicine, 53
 - prenursing, 53
 - prepharmacy, 53
 - preveterinary medicine, 53
 - substitutions for, 55
- Admission with advanced standing, 60
- Advanced Placement Program, 60
 - humanities, 60
 - mathematics, 61
 - natural sciences, 61
 - physics, 61
 - social studies, 61
- Advanced standing,
 - admission with, 60
 - from other institutions, 61, 62
 - in mathematics, 60
- Advisement and Registration Conference, 57
- American College Test,
 - see ACT, 59
- American literature,
 - major or minor in, 102
- Anthropology, courses in, 120
- Applications for admission
 - dates for filing, 59
 - processing, 59
 - when to apply, 57
- Architecture and Art, College of, foundation year, 74
- Architecture, Department of, 73
 - admission requirements, 50
 - courses offered by, 120, 123
 - curriculum, 74
- Art, Department of, 77
 - admission requirements, 50
 - courses offered by, 123, 124, 131, 174
 - foundation program, 77
 - major in, 77, 78
- Architecture and art,
 - courses in, 123
- Art history,
 - courses in, 124
 - major in, 77
- Athletic program, 33

- Athletics,
 - intercollegiate, 33, 117
 - intramural, 117
- Biological sciences,**
 - advanced placement in, 61
 - courses in, 125
 - major and minor in, 100
 - requirements for teaching of, 101
- Business Administration, College of
 - areas of concentration, 80
 - general education requirements, 77
- Business law, 128
- Cars, 33**
- Change-of-program fee, 65
- Chemistry,
 - advanced placement in, 61
 - courses in, 128
 - major and minor in, 101
 - requirements, teaching of, 101
- Chemistry curriculum, 109
- Chicago Circle campus, location, 31
- Classics, courses in, 130
- Communication and public address,
 - major in, 108
- Computer program, 42
- Core program, freshman, 40
- Counseling, 35
- Counseling and testing, pre-entry, 34
- Courses of Instruction, 31, 119
- course credit, reduced for seniors, 119
- Course visitors, 33, 65, 66
- Credentials required for admission, 58
- Credit hour, definition of, 119
- Criminal justice, administration of 109
- Dance,** courses in, 131, 170, 171
- Dean of Men, 38
- Dean of Women, 38
- Deferment from selective service, 46
- Deferred-fee charge, 65
- Degree programs, 31, 32
- Degree requirements, general-University, 67
 - grade-point average for, 67
- Deposits, 56, 64
- Design,
 - courses in, 131
 - major in, 77
- Early decision plan, 58**
- Economics, 80
 - courses in, 137
- Education, courses in, 139
- Education, Division of,
 - admission requirements, 51, 84
 - advanced standing requirements, 84
 - advising program, 84
 - elementary school curricula, 87
 - general education requirements, 86
 - secondary school teaching, 85
 - student teaching, 84
- Electives, definition of, 69
- Emergency aid, 37
- Employment, student, 37
- Energy Engineering,
 - Department of, 90
 - courses in, 139
- Engineering,
 - common-core curriculum, 91
 - fields of concentration, 90
 - graduation requirements, 92
 - undergraduate curriculum, 92
- English,
 - advanced placement in, 60
 - courses in, 140
 - majors and minor in, 102
 - teaching of, requirements, 102
- English literature,
 - major or minor in, 102
- English requirements, 67
- Entrance permit, 57
- Extramural courses, 33
- Fees, 63, 54, 65**
- Finance, 80
 - courses in, 143
- Financial aid, 32, 35
- Foreign-student affairs,
 - coordinator of, 38
- Foreign students,
 - admission of, 49
 - rhetoric courses for, 185
 - speech courses for, 191
- Free elective, definition of, 69
- French,
 - advanced placement in, 60
 - courses in, 144
 - major and minor in, 103
- Freshman Core Program, 40
- Freshman Guidance Examinations, 35

- General curriculum, liberal arts and sciences, 100
- General deposit, 64
- General Education Development Tests, 55
- General education requirement, 67
- Geography,
 - courses in, 145
 - major and minor in, 103
 - teaching of, requirements, 103
- Geology,
 - courses in, 147
 - major and minor in, 103
- German,
 - advanced placement in, 60
 - courses in, 149
 - major and minor in, 104
 - teaching of, requirements, 104
- Grade-point system, 68
 - average, 69
- Grading, University, 68
- Graduation, first class, 31
- Graphic arts, see Plastic and graphic arts, 78
- Greek, courses in, 151
- Guidance examinations, freshman, 35
- "Guidelines and Code," 34

- Health science**, courses in, 151
- Health Service, 37
- High school students, Talented Student Program for, 41
- History,
 - advanced standing in, 61
 - courses in, 152
 - major and minor in, 104
 - teaching of, requirements, 105
- Honors, 39
- Honors Day, 40
- Honors Programs, 38
- Hospital-Medical-Surgical Insurance, 38, 43, 64
- Housing, 33
- Humanities, courses in, 155
 - advanced standing in, 60

- Identification card**, student, 65
- Information Engineering, Department of, 90
 - courses in, 156
- Instructional Resources, Office of, 42

- James Scholars**, 39
- Junior standing, hours required for, 68

- Late-registration fine**, 65
- Latin, courses in, 156
 - advanced placement, 60
- Liberal Arts and Sciences, general education requirements, 98
 - general education sequences, 99
 - General Curriculum, 100
 - graduation requirements, 98
 - honors requirements, 98
 - major, 98
 - minor, 98
- Library, 42
- Loan funds, 36
 - long-term University, 37
 - NDEA, 36
 - short-term University, 37
 - University, 37

- Management**, 80
 - courses in, 157
- Marketing, 80
 - courses in, 158
- Materials Engineering,
 - Department of, 90
 - courses in, 159
- Mathematics,
 - advanced placement in, 61
 - advanced standing in, 60
 - courses in, 162
 - major and minor in, 105
 - teaching of, requirements, 105
- Medical Center, 33
- Medical examination, 57
- Medical-record administration, 111
- Medical technology, 111
- Military deposit, 64
- Military science, 43
 - courses in, 167
- Military service, credit for, 62
 - in physical education, 116
- Music, 32
 - major in (L.A.S.), 106

- National Defense Education Act**
 - loans, 36
- Night classes, 33
- Noncredit courses, fee, 65

- Occupational therapy**, 53, 110
- Orchesis**, 117
- Organizations and activities**,
 - Director of, 38
- Parking lots**, 33
- Permit to enter**, 57
- Philosophy**, courses in, 168
 - major and minor in, 106
- Physical Education, Division of**
 - courses in, 170
 - men's program, 115
 - professional program, 116
 - requirements for graduation, 32
 - women's program, 115
- Physical sciences**, courses in, 172
- Physics curriculum**, 110
- Physics, Department of**, 90
 - Advanced placement in, 61
 - courses in, 172
 - curriculum preparatory to teaching of, 95
 - major and minor in, 106
- Placement tests**, 57
- Plastic and graphic arts**
 - courses in, 174
 - major in, 78
- Political science**, courses in, 180
 - major and minor in, 106
 - teaching of, requirements, 106
- Predentistry**, 111
- Premedicine**, 112
- Prenursing**, 112
- Prepharmacy**, 112
- Preveterinary medicine**, 113
- Priority groups**, 56
- Proficiency examinations**, 63
- Progressive admissions plan**, 56
- Psychology**, courses in, 182
 - major and minor in, 107
 - teaching of, requirements, 107
- Quantitative Analysis-Business Administration**, 80
 - courses in, 183
- Quarter hour**, definition of, 68
- Refunds**,
 - on withdrawal from a course, 66
 - on withdrawal from University, 66
 - on withdrawal of a visitor, 66
- Registration**
 - conference, 57
 - definition of, 32
- Reserve Officers' Training Corps**, 43
- Residence requirement**, 68
- Restricted elective**, definition of, 69
- Rhetoric**, courses in, 184
 - for foreign students, 185
- R.O.T.C.**, 32, 43
- Russian**, courses in, 185
- Scholarships**, 35
 - military, 35
 - University, 35
 - work, 36
- Senior standing**, hours required for, 68
- Service fee**, 65
- Sociology**, courses in, 186
 - major and minor in, 107
 - teaching of, requirements, 107
- Sophomore standing**, hours required for, 68
- Spanish**, courses in, 187
 - advanced placement in, 61
 - major and minor in, 108
 - teaching of, requirements, 108
- Special examination fee**, 65
- Speech and Theatre**, courses in, 188
 - major and minor in, 108
 - teaching of, requirements, 108
- Speech clinic**, 40
- Speech for foreign students**,
 - courses in, 191
- Student activities**, 32
- Student Counseling Service**, 32, 34
 - courses offered by, 191
- Student employment**, 37
- Student identification card**, 65
- Student Services, Office of**, 34
- Systems Engineering, Department of**, 90
 - courses in, 192
- Talented Student Program**, 41
- Television and radio**, major in, 108
- Testing and counseling**, 34
- Test scores**, 59
- Theatre**, See Speech and theatre, 188
- Theatre and oral interpretation of literature**, major in, 108
- Transcripts**, 58
 - fee for, 65

- Transfer students, 49
 - admission average, 50, 51, 52, 53, 54
 - admission requirements for, 49
 - definition of, 49
 - early decision plan, 58
 - Engineering, 91
 - 45-hour rule, 56
- Transfer to Urbana, 31, 33, 70
 - from Urbana, 70
- Tuition and fees, 32, 63, 64, 65
- Tuition and fee deposit, 56, 57, 59, 64
- University loans, 37
- University of Illinois, facilities in Chicago, 33
- Urbana, transfer to, 31, 33, 70
- Visitors, course, 33
 - course fee, 65
 - withdrawal from a course, 66
- Withdrawal from the University, 66, 70
- Women's Athletic Association, 117

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